NASA Procedural Requirements

NPR 7900.3B
Effective Date: June 14, 2007
Expiration Date: June 14, 2012

COMPLIANCE IS MANDATORY

Aircraft Operations Management

Responsible Office: Aircraft Management Division

NASA Interim Directive: Aviation Medical Certification of NASA Aircraft Pilot and Aircrew Members, NM 7901-70

NASA Interim Directive: NASA Procedural Requirement (NPR) 7900.3B, NASA Aircraft Operations Management, NM 7900-65

Table of Contents

Index

Figures

Tables

Preface

P.1 Purpose

This NASA Procedural Requirement (NPR) establishes requirements, responsibilities, and procedures that will assist NASA Centers and other locations operating NASA aircraft to create local policies and procedures for the management of NASA aircraft resources, flight operations, and related matters. This NPR provides a standard approach for the management and use of the NASA Flight Operations program. The purpose of the NASA Flight Operations program is to directly support the Agency mission in aeronautical research and development, space science and applications, space flight, astronaut readiness training, and related activities by providing operational flights in program support aircraft, mission management aircraft (MMA), and research and development aircraft, including both manned aircraft and unmanned aerial systems (UASs). This NPR should be used in conjunction with other governing instructions, handbooks, and manuals.

P.2 Applicability

This NPR is applicable to NASA Headquarters (HQ) and NASA Centers, including Component Facilities and contractors operating NASA aircraft/UASs. This NPR applies to the Jet Propulsion Laboratory (JPL), other contractors, or grant recipients only to the extent specified or referenced in the appropriate contracts, grants, or agreements.

A requirement in this NPR is identified by "shall," a good practice by "should," permission by "may" or "can," expected outcome or action by "will," and descriptive material by "is" or "are" (or another verb form of "to be"). All requirements are numbered consecutively in parentheses at the end of the applicable sentence. Requirements are compiled as a Compliance Matrix in Appendix I.

Note: This NPR alone is not sufficient to stipulate requirements for the contractor or grant recipient. The contract, grant, or agreement must state the requirements(s) from NPR 7900.4 and this NPR.

P.3 Authority

a. The National Aeronautics and Space Act of 1958, as amended, § 203(c)(1), 42 U.S.C. § 2473(a)(1 and 2), (c)(1).

b. National Aeronautics and Space Administration; 14 C.F.R. § 1201.102 Functions.

P.4 Applicable Documents

a. Definition of "civil aircraft" and "public aircraft," 49 U.S.C. §§ 40102 (16), (37).

b. Federal Aviation Regulations, 14 C.F.R. § 1-198.

c. Federal Property Management Regulations, 41 C.F.R. § 102-33.

d. Government Aircraft, 41 C.F.R. §§ 301-10.260 to 301-10.262.

e. Preparation, Submission, and Execution of the Budget, OMB Circular A-11 (revised), June 30, 2006.

f. Performance of Commercial Activities, OMB Circular A-76 (revised), May 29, 2003.

g. Improving the Management and Use of Government Aircraft, OMB Circular A-126 (revised), May 22, 1992.

h. NPD 1000.3, The NASA Organization.

i. NPD 8700.2, NASA Policy for Safety and Mission Success.

j. NPD 7900.4, NASA Aircraft Operations Management.

k. NPD 4200.1, Equipment Management.

l. NPD 4300.1, NASA Personal Property Disposal Procedures and Guidelines.

m. NPD 1210.2, NASA Surveys, Audits, and Reviews Policy.

n. NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping.

o. National Aeronautics and Space Administration Charter of the Aerospace Safety Advisory Panel, November 18, 2003.

p. NPR 8715.3, NASA General Safety Program Requirements.

q. NPR 8715.5, Range Safety Program.

r. NPR 4200.1, NASA Equipment Management Manual.

s. NPR 4310.1, Identification and Disposition of NASA Artifacts.

t. NPR 4100.1, NASA Materials Inventory Management Manual.

u. NPR 1441.1, NASA Records Retention Schedules.

v. Memorandum of Agreement between NASA and the Department of the Navy on Support of NASA Aeronautical Research Activities, February 4, 1959.

w. Memorandum of Agreement between NASA and the Department of the Air Force on Use of Air Force Aircraft by NASA, May 20, 1959.

P.5 Measurements/Verification

1. Does the HQ Aircraft Management Division fulfill its responsibilities as specified within this NPR? To determine the compliance of the HQ Aircraft Management Division (AMD) with the requirements contained in this NPR, internal and external auditors responsible for verifying HQ requirements and processes evaluate the HQ AMD's performance against the requirements contained within this NPR.

2. Are Centers following the content and process requirements of this NPR that are applicable to Centers for Center aircraft operations and commercial aircraft services in accordance with this NPR? To determine Center compliance with this NPR, Center Directors or designees determine and document compliance by applying a verification process that is tailored to meet the needs of the Center. The HQ AMD, with the support of the Inter-Center Aircraft Operations Panel (IAOP), conducts biennial reviews of the Centers and spot-checks to review Center documentation and implementation of Center-specific aircraft operations and commercial aircraft services activity.

P.6 Cancellation

a. NPR 7900.3A, Aircraft Operations Management, April 8, 1999.

/S/
Thomas Luedtke
Associate Administrator
Office of Institutions and Management

Chapter 1. Flight Operations, General Overview

1.1 Concept of Operations

1.1.1 NASA maintains an adequate number of aircraft/UASs to meet its Agency mission requirements, which include, but are not limited to, research, program support, and mission management.

1.1.2 Where practical, NASA seeks the use of aircraft that can support multiple mission requirements.

1.1.3 NASA uses its aircraft/UAS resources in an effective and efficient manner to conduct and support missions, approved/planned programs, and projects.

1.1.4 NASA maintains the level of airworthiness and aircraft/UAS operating standards that will ensure the safe operation of aircraft/UAS missions.

1.1.5 NASA controlled aircraft are subject to Federal Aviation Regulations with respect to the use of airspace, the control of air traffic, and aircraft registration. Aircraft on loan from the U.S. Armed Forces are not subject to civil registration. NASA aircraft pilots shall secure diplomatic clearance approval prior to entry into the airspace of a foreign country except for brief use of foreign airspace adjoining the United States as directed by air traffic control (ATC). [1]

1.1.6 For each Center operating aircraft/UASs or procuring aircraft/UAS services, the Center Director shall maintain a program-independent Flight Operations Office, the specific purpose of which will be to plan, organize, direct, and control the operations, maintenance, modification, safety, and support of all Center-assigned or -contracted aircraft. [2] The head of this office is responsible for all Center-assigned or -contracted aircraft. The head of this office shall be the senior line manager who is responsible for aviation activities at the Center. [3] The Center Director shall assign the head of the Flight Operations Office the authority and responsibility, and provide the resources necessary to manage and conduct safe, effective, and efficient operations in accordance with NASA directives, guidance, and other applicable Federal regulations. [4]

1.1.6.1 Prior to contract award, the head of the Flight Operations Office shall review and concur upon any Center contract or agreement that includes aviation operations. [5]

1.1.6.2 If a Center does not have a Flight Operations Department, the Center Director shall have another Center's Flight Operations Department review and concur on such contracts or agreements for them each time they procure aviation services. [6]

1.2 Assignment of Authority and Responsibility

1.2.1 The Assistant Administrator for the Office of Infrastructure and Administration shall designate aircraft classifications and assign aircraft to the appropriate Center after consultation with the affected Mission Directorates and Center Directors. [7] Records created throughout flight operations management shall be maintained, managed, and disposed of by each Center's Flight Operations Office or designated office in accordance with NPR 1441.1, NASA Records Retention Schedules. [8]

1.2.2 Mission Directorate Associate Administrators shall:

1.2.2.1 Coordinate early with the Office of Infrastructure and Administration to establish program or project plans involving the requirement for acquisition or use of aircraft, including UASs. [9]

1.2.2.2 Comply with OMB Circulars A-76 and A-126 as they apply to the acquisition of aircraft/UASs and coordinate related documentation requirements with the Assistant Administrator for the Office of Infrastructure and Administration. [10]

1.2.2.3 Annually review aircraft mission and program requirements, use, and associated costs, and project those requirements and costs over five years in an annual report to the HQ AMD not later than September 30 of each year. [11]

1.2.2.4 Submit OMB Circular A-11, Exhibit 300, for aircraft and aircraft programs funded by their Directorate. These submissions shall be coordinated with the Office of Infrastructure and Administration and the Office of the Chief Financial Officer. [12]

1.2.3 Center Directors shall be responsible for:

1.2.3.1 The airworthiness and flight safety of assigned aircraft, including UASs. [13]

1.2.3.2 Coordination with the Office of Infrastructure and Administration in establishing program or project plans involving the requirement, assignment, and operation of aircraft/UASs. [14]

1.2.3.3 Annually reviewing aircraft mission and program requirements (for those programs controlled/funded by their respective Center), use, and associated costs, and projecting those requirements and costs over five years in an annual report to the HQ AMD not later than September 30 of each year. [15]

1.2.3.4 Ensuring compliance with the Financial Management Requirements (FMR) in the appropriate use and application of function codes that are used to account for, track, and report aircraft costs. [16]

1.2.3.5 Quarterly reporting of aircraft operations and costs to Headquarters, as stipulated in chapter 11 and specific MMA reporting requirements detailed in chapter 4 of this NPR. [17]

1.2.3.6 Ensuring compliance with 41 C.F.R. §102-33, 41 C.F.R. § 300/301, and OMB Circular A-126. [18]

1.2.3.7 The budget for personnel and travel in support of the IAOP. [19]

1.2.3.8 Approving aircraft charters or leases for periods of 30 days or less with seven days prior notice to the HQ AMD within the Office of Infrastructure and Administration. [20]

1.2.3.9 The technical assessment, cost evaluation, acquisition, use, and disposition of all aircraft/UASs under their control. [21] In addition, Center Directors are responsible for the acquisition of aircraft/UASs used solely as wind tunnel or other nonflyable test models. Center Directors shall coordinate and submit all aircraft acquisition and disposition proposals to the Assistant Administrator for the Office of Infrastructure and Administration for approval. [22] Center Directors shall report all acquisition and disposal actions to the HQ AMD to comply with Federal aircraft data reporting requirements. [23]

1.2.3.10 Ensuring that Center managers who acquire aircraft/UAS or aviation services coordinate those acquisitions with the Center's Flight Operations Department to ensure compliance with the NASA Aviation Safety Program and aircraft management policies. [24] If the Center does not have an aircraft management office, prior coordination shall be conducted with the HQ AMD.

1.2.4 Program/project managers shall:

1.2.4.1 Coordinate early with the Office of Infrastructure and Administration to establish program or project plans involving the requirement for acquisition or use of aircraft, including UASs. [25]

1.2.4.2 Prepare a Business Case Analysis (BCA) in accordance with OMB Circulars A-11, A-76, and A-126 prior to the acquisition of aircraft/UASs and gain approval of the BCA by the cognizant Mission Directorate Associate Administrator and the Assistant Administrator for the Office of Infrastructure and Administration. [26]

1.2.4.3 Annually review aircraft mission and program requirements, use, and associated costs and project those requirements and costs over five years to support the Mission Directorate's annual report to the HQ AMD not later than September 30 of each year. [27]

1.2.4.4 Submit OMB Circular A-11, Exhibit 300, as appropriate, for aircraft and aircraft programs funded by their Directorate. These submissions shall be coordinated with the appropriate Mission Directorate, the Office of Infrastructure and Administration, and the Office of the Chief Financial Officer. [28]

1.2.5 Center Chief of Flight Operations

1.2.5.1 The Center Chief of Flight Operations is the senior line manager with authority over flight activities operated or controlled by the Center and is directly responsible to the Center Director for the safe and effective conduct of those activities. The Chief of Flight Operations shall hold the following qualifications for assignment to this position:

a. A minimum of ten years of relevant aviation-related experience, supervisory or managerial experience in aircraft operations similar to the primary aircraft type operated at the Center, and a high level of familiarity with the organization's aircraft operations. [29]

b. Current or previously held qualifications as a NASA Pilot in Command (PIC), a military rating as an Aircraft Commander, or a Federal Aviation Administration (FAA) Airline Transport Pilot (ATP) certificate. [30]

1.2.5.2 The Center Chief of Flight Operations is authorized to fly Center aircraft.

1.2.5.3 The Center Chief of Flight Operations shall perform the following duties:

a. Ensure the effective management of flight operations under that Center's cognizance, per NPD 7900. [31]

b. Authorize personnel to operate and maintain aircraft under NASA control. The Center Flight Operations Office has the final operational flight release authority for any NASA aircraft operating from or under the cognizance of that Center. [32]

c. Determine the number of aircraft types in which an individual crewmember may maintain qualification at any given time and annually review that determination. [33]

d. Recommend assignment of the Center Aviation Safety Officer (ASO), with the concurrence of the Center Chief of Safety and Mission Assurance, to the Center Director for approval. [34]

e. Fly as a crewmember or observer on all assigned aircraft, where practicable and as necessary, to observe performance of assigned flightcrews. [35]

1.2.6 Center Aviation Safety Officers

1.2.6.1 The ASO shall manage the Center's aviation safety program as described in chapter 6 of this

NPR. [36] The following describes the responsibilities, authority, and minimum qualifications of the Center ASO:

1.2.6.2 The ASO shall be a civil servant assigned to the Flight Operations Department, serve as the Center's focal point for aviation safety, and act on behalf of the Center Director when discharging this responsibility. [37] The ASO will advise the Chief of Flight Operations regarding safety issues/concerns within the organization. Managers may use the advice of the ASO in formulating organizational decisions, but will not expect or rely upon the ASO to make managerial decisions.

1.2.6.3 If a safety concern has not been dealt with sufficiently by the Flight Operations organization, the ASO may take the concern directly to the Center Director. In addition, the ASO may take the concern to the Chief, Safety and Mission Assurance or the Assistant Administrator for the Office of Infrastructure and Administration.

1.2.6.4 The ASO will meet NASA PIC qualifications and the requirements in section 6.2.9.

1.2.7 Chief Pilot

1.2.7.1 To qualify for assignment, the Chief Pilot shall:

a. Hold and maintain qualification as a NASA PIC. [38]

b. Have at least three years experience within the past six years as PIC of an aircraft similar in category and class to at least one of the aircraft used in the types of operations being conducted at the Center. [39]

c. Demonstrate satisfactory supervisory and managerial capabilities. [40]

1.2.7.2 Specific duties will be defined at the respective NASA Center.

1.2.8 Chief of Maintenance

1.2.8.1 To qualify for assignment, the Chief of Maintenance shall:

a. Have had at least three years of experience within the past six years in aircraft maintenance in a similar-size operation maintaining aircraft similar to those used by the Center, with management experience such as supervisor or lead in aircraft maintenance. [41]

b. Have held an FAA Airframe and Power Plant (A&P) Certification or have held an equivalent military designation, or demonstrate an equivalent level of qualifications and expertise. [42]

1.2.8.2 Duties will be defined at NASA Centers.

1.2.9 Chief of Quality Assurance

1.2.9.1 To qualify for assignment, the Chief of Quality Assurance shall:

a. Hold a current FAA Inspection Authorization Certificate or have held an equivalent military designation, or demonstrate an equivalent level of qualifications and expertise. [43]

b. Maintain a level of inspection expertise and activity needed to meet FAA Inspection Authorization Certificate renewal requirements or the military equivalent. [44]

c. Have had at least three years of maintenance experience, within the last six years, one year of which must have been as a maintenance inspector. [45]

d. Have at least one year of experience in a supervisory capacity. [46]

1.2.9.2 Duties will be defined at NASA Centers.

1.2.10 The IAOP has the responsibility to:

1.2.10.1 Advise the Assistant Administrator for the Office of Infrastructure and Administration regarding operational, management, and safety policies for NASA aircraft.

1.2.10.2 Conduct periodic meetings with the HQ AMD to review policies and procedures related to aircraft/UAS operational matters affecting all Centers and to make recommendations to the AMD regarding policies, procedures, and guidelines that may be applicable to all Centers.

1.2.10.3 Conduct reviews of a special nature at the request of the Assistant Administrator for the Office of Infrastructure and Administration and periodic reviews of all aspects of flight operations at NASA Centers, including compliance with applicable Federal regulations and Headquarters and Center policies and procedures.

1.2.11 The HQ AMD has the responsibility to:

1.2.11.1 Coordinate the formulation of Agency-wide policies, procedures, and guidelines concerning aircraft/UAS operation and ensure their effective and efficient communication to Centers and appropriate Headquarters offices.

1.2.11.2 Advise and assist the Assistant Administrator for the Office of Infrastructure and Administration, Mission Directorates, and Center Directors concerning the acquisition/disposition process.

1.2.11.3 Advise the Assistant Administrator for the Office of Infrastructure and Administration regarding the establishment of policy for the use of NASA aircraft/UASs.

1.2.11.4 Coordinate the findings and recommendations of IAOP reviews dealing with institutional management issues with the appropriate institutional Associate Administrator.

1.2.11.5 Maintain liaison with other Government agencies and the private sector on matters pertaining to flight operations, maintenance, and management practices common to all Centers.

1.2.11.6 Provide coordination and other assistance in the assignment of IAOP teams as they review and evaluate the adequacy of Center organizations, facilities, and procedures for flight operations.

1.2.11.7 Provide inter-Center and interagency coordination for logistics support to Centers, as necessary.

1.2.11.8 Collect, collate, and report Agency aircraft data (e.g., Federal Aviation Interactive Reporting System [FAIRS] data) to other Federal agencies.

1.2.12 The Chief, Safety and Mission Assurance provides leadership, policy direction, functional oversight, assessment, standards, and coordination for safety and mission assurance affecting NASA aviation operations.

1.3 Classification of Aircraft Use

1.3.1 NASA's aircraft generally fall under three classifications: Research and Development (R&D), Program Support (PS), and MMA.

1.3.2 Research and Development. R&D aircraft provide the means for NASA's Mission Directorates to conduct research at various altitudes and atmospheric conditions. R&D aircraft are flown to advance aeronautics research, to expand human knowledge of Earth and space science, and to

support the Vision for Space Exploration.

1.3.3 Program Support. PS aircraft enable the accomplishment of NASA program objectives. Such use includes, but is not limited to, astronaut training, safety chase, photo chase, cargo transport, flightcrew training, range surveillance, launch security, launch and landing weather reconnaissance, contingency support, and command and control.

1.3.4 Mission Management Aircraft. MMA provide a means of transportation for NASA personnel to meet mission-required travel needs, as defined in OMB Circular A-126 and this NPR. Mission management flights may be classified as "Mission Required" only when failure to use a NASA MMA would have a clear, negative impact on a NASA operational mission, prevent timely response to an aircraft or spacecraft accident, or threaten the health and safety of NASA personnel, and only when such travel could not be conducted using commercial airlines, charter aircraft service, or ground transportation to fulfill that mission need. All passenger travel that can reasonably be performed using commercial airlines, charter aircraft service, or ground transportation to meet the mission need may not be designated as Mission Required.

1.4 Waivers

1.4.1 When deviations from this NPR are necessary, Center Directors or Associate Administrators shall submit requests for waivers to the Assistant Administrator for the Office of Infrastructure and Administration via HQ AMD. [47] Prior written approval from the Assistant Administrator for the Office of Infrastructure and Administration shall be obtained before implementing procedures that are less restrictive than those contained in this NPR. [48]

1.4.2 Only the Administrator or Assistant Administrator for Infrastructure and Administration, who is responsible for this NPR, or delegated authority, may waive requirements contained in this NPR.

1.4.3 A waiver may be approved only if it meets all of the following criteria:

a. It is not prohibited by Federal policy.

b. It would not present an undue risk to public health, safety, the environment, or personnel.

c. It is justified under the particular circumstances.

1.4.4 The waiver approval authority shall only approve waivers for a specific event, period, or duration and shall specify the boundaries of the requirement being waived. [49]

1.4.5 The waiver approval authority shall notify all who have current waivers against this NPR when this NPR is updated and request verification of continued validity. [50]

1.4.6 NASA officials who request waivers shall document the following in the request for waiver:

a. Identification of the directive and specific requirement(s) for which the waiver is requested.

b. Scope (e.g., site, facility, operation, or activity) and duration of the waiver request.

c. Justification for the waiver, including:

1. Purpose/rationale for requesting the waiver.

2. Whether application of the requirement in the particular circumstances would conflict with another requirement.

3. Whether application of the requirement in the particular circumstances would not achieve, or is

not necessary to achieve, the underlying purpose of the requirement.

4. Any other pertinent data or information related to the waiver request (e.g., cost or schedule considerations).

5. Identification and justification of the acceptance of any additional risk that will be incurred if the waiver is granted.

6. A description of any special circumstances that warrant granting the waiver, including whether: (a) application of the requirement in the particular circumstances would not be justified by any safety and health reason; (b) the waiver would result in a health and safety improvement that compensates for any detriment that would result from granting the waiver; or (c) there exists any other material circumstances that were not considered when the requirement was adopted, for which it is in the public interest to grant a waiver.

7. A description of any alternative or mitigating action that will be taken to ensure adequate safety and health and protection of the public, the workers, and the environment for the period the waiver will be effective. [51]

Chapter 2. Airworthiness and Maintenance

2.1 Purpose

2.1.1 This chapter establishes policy to ensure the airworthiness and maintenance of NASA aircraft/UASs and non-NASA aircraft used to perform NASA missions. It also establishes policy for safety and flight readiness reviews performed in conjunction with the acceptance or modification of aircraft.

2.2 Airworthiness General Requirements

2.2.1 NASA aircraft shall be operated in an airworthy condition as certified by a formal NASA airworthiness review board (ARB), under the authority of a NASA Center Director, using a NASA Certificate of Airworthiness process. [52] All NASA aircraft shall possess and maintain a NASA Certificate of Airworthiness (appendix E) approved by the Center Director. [53] Additionally, all aircraft used for MMA purposes shall possess a "Normal" or "Transport" category FAA Certificate of Airworthiness. [54] When NASA aircraft are transferred between Centers, a new NASA Certificate of Airworthiness approved by the receiving Center Director shall be obtained. [55]

2.2.2 Airworthiness, flight safety, and mission readiness reviews, including configuration control, shall be conducted for all aircraft modifications, with the exception of those noted in 2.4.2.4 that are cleared through an airworthiness review process (ARP) or configuration control process. [56] These review processes are to clear unique or nonstandard internal or external payloads or stores configurations for flight and to review nonstandard flight operations--those other than normal aircraft operations for the specific aircraft. The purpose of these reviews is to identify hazards so as to minimize risks to persons and property and to enhance the likelihood of mission and program success. Formal review requirements will be appropriate for the types of modifications incorporated, the specific mission or project requirements, and the operational risks involved.

2.2.3 The ARP may include several levels of review. Each Center shall clearly identify the appropriate airworthiness review process for experimental, research, and operational configurations and nonstandard ground or flight operations for all aircraft operated by the Center. [57]

2.3 Airworthiness Responsibilities

2.3.1 The Chief, Safety and Mission Assurance formulates NASA safety policy and provides independent oversight of NASA aviation safety and safety procedures or guidelines.

2.3.2 Center Directors shall establish airworthiness, flight safety, mission readiness, and configuration control review processes and procedures to identify any hazards, to manage the risks associated with flight programs, to ensure safe flight operations, to manage and thoroughly document aircraft configurations, and to ensure that flight objectives satisfy programmatic requirements. [58] Center Directors shall ensure that these procedures are incorporated into the contracts of those who operate and maintain NASA aircraft. [59]

2.4 Airworthiness, Flight Readiness, and Safety Reviews

2.4.1 Center Directors shall establish procedures to ensure that airworthiness and safety reviews are

conducted for flight operations or missions. [60]

2.4.1.1 Reviews shall ensure that hazards associated with aircraft experimental modifications, research, or unique internal or external payloads and nonstandard operations are identified and that risks are adequately managed to enhance the likelihood of mission and program success for all aircraft missions or operations and to minimize the risks to persons or property. [61]

2.4.1.2 Program managers shall review flight programs early in the development cycle to identify the need and schedule for additional safety-related resources, procedures, or reviews. [62] Managers shall ensure that aircraft modifications are accomplished with sufficient time for engineers and technicians to safely complete required tasks. [63]

2.4.1.3 Center Directors shall establish configuration control procedures to ensure that the configuration of each NASA aircraft is fully documented and reviewed. [64] A minimum equipment list (MEL) shall be established for all non-test-related equipment for all aircraft operations. [65] Test-related equipment will be handled through the flight test planning process. If test equipment remains on the aircraft for non-test-related missions, then such equipment shall be addressed in the aircraft MEL. [66] Waivers to a MEL may be granted by the Chief of Flight Operations but may not be delegated to a lower office/position.

2.4.2 The ARP is the process by which an engineering and safety analysis is performed to determine that an aviation system or its component parts meets minimum design criteria, standards, and configuration for the conduct of safe flight operations. The ARP also includes a review of the operations of NASA aircraft when those operations are nonstandard for that aircraft type, place the aircraft into a more hazardous environment than normal, or involve experimental internal or external payloads, configurations, or noncertified external stores, including the dropping of uncertified stores, which may affect the airworthiness of the aircraft.

2.4.2.1 An ARP is required prior to an aircraft commencing its first or subsequent test or research flights in nonstandard configurations or operating envelopes. An ARP approval is valid only for the specific configurations and flight envelopes and operations specified in the approval. Any change to the specified configuration or flight operation requires issuance of a separate or amended ARP approval per individual Center procedures.

2.4.2.2 Examples of configuration and envelope changes requiring an ARP approval include, but are not limited to:

a. Structural and material changes that alter the basic aircraft design configuration.

b. Modification of the exterior contour or mold line of the aircraft to an experimental configuration (e.g., addition/removal of wing fence, ventral fin, vortex generator, air induction system, auxiliary inlets, and nonstandard antenna configurations or locations).

c. Modification to the flight control system, including software revisions, to nonstandard configurations.

d. A new or modified propulsion system or its control system, including software revisions, that is nonstandard for the aircraft.

e. Modification of the displays or annunciation affecting critical information presented to the aircrew (e.g., situational awareness, aircraft control, air vehicle launch) that are nonstandard for the aircraft.

f. Modification of any subsystem interfacing with and affecting flight or propulsion systems (e.g., mission computer, navigation, and warning and caution systems) that are nonstandard.

g. Modification of the aircrew life support systems to nonstandard configurations.

h. Evaluation of crosswind landing or wet runway landing limits, emergency procedures, structural or flight control limits, wind envelopes, or helicopter external lift, cargo hook system, or tow limits that are outside the normal limits for the aircraft.

i. Flight test instrumentation that interfaces with normal aircraft systems or that may affect the operation of those systems.

j. Intentional operation in a degraded mode for test purposes (e.g., simulation of partial loss or malfunction of flight control system, engine, and avionics).

k. Dropping of uncertified stores or objects.

l. Any other modifications, payloads, or operations that are nonstandard according to established flight manuals, procedures, or FAA certification requirements (if operated under an FAA airworthiness certificate).

2.4.2.3 Minor aircraft system modifications that do not interface with or affect the standard operation of aircraft systems or alter aircraft aerodynamic characteristics may be reviewed through a configuration control process. Examples of modifications that might fall into this category include such systems as:

a. Additions of C-band tracking beacons.

b. Addition of onboard video-recording equipment.

c. Addition of global positioning system (GPS) recording or tracking systems.

2.4.2.4 The following aircraft modifications may not require airworthiness certification, flight safety, or mission readiness reviews:

a. Airworthiness Directives (ADs), commonly issued by FAA.

b. Maintenance Advisories, which are issued by multiple sources, such as the U.S. Navy, the U.S. Air Force, and manufacturers.

c. One Time Inspections (OTIs), which may be issued by multiple sources.

d. Service Bulletins/Service Instructions (SB/SI), which may be issued by manufacturers.

e. Service Information Letters, which may be issued by multiple sources.

f. Time Compliant Technical Orders (TCTOs), issued by the U.S. Air Force.

g. Technical Orders (TOs).

h. Technical Directives (TDs), issued by the U.S. Navy.

i. Power Plant Bulletins/Power Plant Changes (PPB/PPCs).

j. Supplemental Type Certificates (STCs) issued by the FAA.

2.4.2.5 Modifications to aircraft, such as avionics upgrades, that meet FAA certification requirements according to applicable FAA regulations may be handled through a configuration control process.

2.5 Staffing for Airworthiness Review Process

2.5.1 Each Center Director shall ensure that the ARP is staffed with personnel possessing the appropriate scientific, engineering, operational, maintenance, and managerial expertise. [67] At least one member of the ARP shall be a NASA pilot. [68] The ASO also shall be a member. [69] The process reviews project or mission hazards, aircraft modifications, project processes, and procedures related to safety and mission assurance. In addition, the process approves appropriate risk mitigation procedures/techniques and provides oversight for all planned operations. Additionally, each Center Director is responsible for establishing a list of senior managers and/or senior engineers who are responsible for conducting the ARP and approving projects or missions for flight, including appointing personnel responsible for managing and executing the Center ARP review board and maintaining records of airworthiness approvals.

2.5.2 The ARP review board may be broken down into several subpanels to facilitate the overall review process. For instance, separate reviews of technical issues and safety hazards may facilitate a detailed review of specific aspects of the project or mission by discipline experts, who then advise the Center review board. Any cockpit or cabin modifications that might interfere with aircrew egress shall be reviewed by a subpanel including aircrew and life support personnel. [70]

2.5.3 The ARP approval for flight may be for an entire test or research program or be restricted to a certain number of flights or missions and require additional review once defined project or mission goals are achieved.

2.5.4 The ARP shall be continual throughout the course of a project. [71] The Center Director may establish periodic reviews of projects to review project progress subsequent to defined project events (including successes or failures) or at other points in the project to review the overall airworthiness of the aircraft for the intended mission and the progress of the project.

2.5.5 Each Center shall establish the content of the ARP based on the aircraft mission, complexity of the modifications, and the inherent hazards associated with the operation. [72] Content for ARP approvals shall be documented in Center-level ARP procedures. [73] The following are typical of the information required for an ARP to approve an aircraft modification or flight operation for a specific aircraft configuration:

2.5.5.1 A description of the aircraft modifications including aircraft configuration, loads, flight envelope, aircraft weight and balance data, reference to applicable mechanical and electrical design documents, reference to applicable software version description documents, and a listing of associated computer software configuration. The ARP reviews each of these items as applicable for the specific aircraft or subsystems under review.

2.5.5.2 Applicable engineering analysis that describes design criteria, aircraft loads and safety limits, external pod loads, electrical or mechanical system vibrations, aero-elastic vibrations (flutter), aero-servo-elastic effects, thermal loads, electrical system loads, and other abnormal environmental conditions and their effects on aircraft performance, stability, and control or aircraft systems operation. The results of tests conducted to verify the engineering analysis also shall be considered. [74]

2.5.5.3 A description of the required flight operations, including operating procedures, test conditions, maneuvers, required instrumentation, mission control operations, mission rules and flight limitations, nonstandard operation or inspection criteria, and associated checklists. Actions to be taken in the event of in-flight malfunctions or emergency conditions associated with the aircraft modifications or nonstandard operations also shall be described. [75]

2.5.5.4 A safety hazard analysis of systems and operations, including risk assessment and risk reduction actions and the methodology used to reduce the risks to acceptable levels (design, safety devices, warnings, procedure or training, or other methods).

2.5.6 ARP approval is based on the results of a Center-approved engineering and safety analysis. The final approval shall contain a description of the configuration of the aircraft, operating instructions and procedures, operating limitations and restrictions, and specific maneuvers or operations for which the aircraft is cleared. [76]

2.6 Maintenance Program

2.6.1 NASA aircraft shall be maintained in accordance with an established and documented maintenance program, using standards of quality in workmanship, materials, and support equipment that will ensure airworthiness of aircraft for safety of flight. [77] Each Center shall develop written guidance for maintenance practices and procedures that include aircraft-specific (manufacturer, NASA, or Department of Defense [DoD]) maintenance practices. [78]

2.6.2 All NASA aircraft, specifically designated ground support equipment, and aircraft operated by NASA flight and ground crews shall be maintained under an approved airworthiness program. [79] The program/process/ARP shall comply with applicable FAA-approved Original Equipment Manufacturer (OEM) standards, DoD technical standards, or NASA standards in material quality and workmanship. [80] NASA aircraft maintenance and quality assurance inspection programs shall address, at a minimum, the following activities:

2.6.2.1 Calendar, depot, periodic, phase, pre-flight, and post-flight inspections, and provisions for inspection and certification procedures of specific maintenance actions. [81]

2.6.2.2 Determination of the serviceability, authenticity, traceability, and airworthiness of parts, components, accessories, and assemblies by subjecting them to inspections, tests, or operational checks. [82]

2.6.2.3 A configuration control process to ensure compliance with applicable airworthiness, service and safety bulletins, or other pertinent requirements, such as those from FAA, DoD, or OEMs. The process shall allow for documentation of alternate procedures or inspections if they are substituted. [83]

2.6.2.4 A program for trend analysis and investigation of recurring discrepancies, high-failure-rate components, and high-usage materials. [84]

2.6.2.5 Documentation consisting of aircraft logs and records, accessory change records, weight and balance records, and aircraft property accountability records, as well as documentation required by NPR 4100, NASA Materials Inventory Management Manual. [85]

2.6.3 Quality Assurance

2.6.3.1 A comprehensive aircraft maintenance quality assurance program shall be established at each NASA Center that is responsible for the maintenance of NASA aircraft. [86]

2.6.4 Training

2.6.4.1 The Center Director shall ensure that quality assurance inspectors and maintenance personnel are trained, qualified, and assigned to implement a comprehensive maintenance and quality assurance program for Center Flight Operations. [87]

2.6.5 Depot-Level or Major Aircraft Modifications

2.6.5.1 Center Flight Operations shall maintain continuous onsite oversight of vendors and facilities performing aircraft depot-level overhauls or major aircraft modifications to ensure quality of

workmanship, maintenance of NASA standards, and schedule and cost control. [88]

2.6.5.2 Individuals assigned onsite responsibilities shall have expertise and experience in aircraft airworthiness standards and requirements. [89]

2.6.6 Tool Control and Foreign Object Damage (FOD) Control

2.6.6.1 Each Center shall have a documented tool control program. [90]

2.6.6.2 Each Center shall have a documented FOD control program. [91]

Chapter 3. Research and Program Support Operations

This chapter applies to NASA piloted aircraft research and program support operations.

3.1 Operations

3.1.1 Flight Authorization.

3.1.1.1 Center Chiefs of Flight Operations shall establish procedures to ensure that all flights of NASA aircraft are properly approved and documented, allowing for all contingencies such as deployed aircraft and aircraft ferry approvals. [92]

3.1.2 NASA Aircraft Use.

3.1.2.1 NASA aircraft are used primarily for research and development, program support, and mission management flights, including flights for:

a. Flight proficiency, including cross-country operations, to meet currency and annual requirements for assigned personnel.

b. Maintenance checks and/or ferry flights.

c. Logistics support for NASA programs.

3.1.2.2 Emergency lifesaving, humanitarian operations, and Homeland Security missions, as pre-approved by the Center Director, may be carried out in any NASA aircraft he/she designates; the circumstances shall be documented and reported to the Assistant Administrator for the Office of Infrastructure and Administration. [93]

3.2 Assignment of Pilot in Command of NASA Aircraft

3.2.1 The PIC of a NASA aircraft shall be a designated NASA pilot. [94] Designated NASA pilots are those who perform piloting duties as a part of their official position description, fulfill NASA contract requirements, or fly in accordance with an interagency agreement, such as a military pilot on loan to NASA. Center Chiefs of Flight Operations, with the concurrence of the Center Director, may designate as a PIC, on a temporary basis, individuals possessing required aeronautical qualifications to support NASA requirements.

3.2.2 The PIC of a NASA aircraft is responsible at all times for the safe operation of the aircraft and the safety of its occupants and is the final authority as to whether a flight will occur. The PIC is the final authority as to whether a flight will be delayed or diverted for reasons of weather, aircraft conditions, or other safety-related considerations.

3.2.3 The PIC of a NASA aircraft shall ensure the crew is briefed on the mission plan, safety procedures, and emergency information, including emergency egress. [95]

3.2.4 Center Chiefs of Flight Operations shall have a process to train, designate, and document individuals authorized to pilot Functional Check Flight operations. [96]

3.3 Documentation.

Records pertaining to NASA flight activities shall include, at a minimum, the following:

a. Approval of mission.

b. Name and duty status of all on board.

c. Purpose of the flight.

d. Routing or flight events and takeoff /landing times. [97]

3.4 Flightcrew Requirements and Currency

3.4.1 NASA flightcrews shall be qualified in accordance with written standards set forth in Center-developed criteria. [98] Records of qualification and flight evaluation are required and shall be maintained in aircrew training records. [99] A review of pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met. [100] The Center Chief of Flight Operations shall designate the crewmembers for aircraft that are under the Center's purview. [101]

3.4.2 NASA flightcrew members will be medically certified using NASA medical qualifications, per chapter 7 of this NPR.

3.4.3 A comprehensive pilot proficiency program is critical to flight safety at each Center for pilots flying research and program support aircraft. Such programs are specific to the assigned missions and reflect an in-depth evaluation of pilot proficiency and capability. Elements of pilot proficiency programs include the following:

3.4.3.1 Center Flight Operations shall impose sufficient proficiency requirements or flight time/sortie requirements on flightcrews to meet mission needs. [102] Center flightcrew currency shall, at a minimum, include the following:

a. Annual night flying requirements.

b. Landings in category (fixed-wing/rotorcraft).

c. Six instrument approaches under actual or simulated conditions within six calendar months.

d. Method to regain instrument or landing currency, once lapsed.

e. Completing 100 hours of flight time per fiscal year, PICs must fly at least 50 of those hours as PIC. The hours shall be flown in any aircraft or flight simulator approved by the Center Chief of Flight Operations. [103]

3.4.3.2 Center directives shall establish separate aircrew qualification and currency requirements for unique aircraft (e.g., project, military, experimental) in which the aircrew cannot meet the above requirements. [104]

3.4.4 Flight proficiency shall be evaluated at least once per year by a NASA or NASA-designated pilot who is an instructor or examiner pilot in the aircraft used for the evaluation. [105] When available, a suitable simulator or its equivalent may be used for this purpose at the discretion of the Center Chief of Flight Operations. Evaluations conducted by Federal Aviation Regulations (FAR) part 142 Training Centers also may be used to satisfy pilot annual evaluations at the discretion of the Center Chief of Flight Operations.

3.4.5 Pilot Instrument Evaluations. Instrument flying proficiency shall be evaluated at least once per year using professional aeronautical standards such as FAA Instrument Practical Test Standards. [106] The instrument evaluation may be combined with the annual proficiency evaluation or completed separately. The instrument proficiency check may be accomplished in a simulator approved by the Center Chief of Flight Operations.

3.4.6 Simulations. Annual flight simulator training in each aircraft category (fixed-wing/rotorcraft) is required if available. Realistic, mission-oriented scenarios may be used to complement the annual proficiency and instrument check requirements.

3.4.7 Tests. Written tests shall be administered and reviewed annually by a check pilot to ensure current pilot knowledge of air traffic control procedures, aircraft systems, normal and emergency operating procedures, Agency and local instructions, and other pertinent regulations and procedures. [107] Centers co-located with military organizations who conduct "instrument schools" may substitute such training for the above air traffic control procedural testing.

3.4.8 Reviews. Pilot annual flight evaluations shall be reviewed by the Center Chief of Flight Operations or designee. [108]

3.4.9 Guest Pilots/Researchers and Media Flights. Each Center Chief of Flight Operations shall establish local instructions regarding training and currency requirements that must be met for a guest pilot/researcher. [ ] The Center shall establish policies for flying media representatives. [110]

3.4.10 Flight Engineers shall possess an FAA Flight Engineer Certificate appropriate for the aircraft category or equivalent military certification. [111] Centers shall develop alternate training programs to satisfy this requirement should the above personnel not be available. [112]

3.4.11 Qualified non-crewmembers shall be authorized by the Chief of Flight Operations to participate in flight operations to support mission requirements. [113] Qualified non-crewmembers shall be trained and will maintain qualification in accordance with local Center policies and procedures which shall, at a minimum, include cabin emergency and egress procedures. [114] Qualified non-crewmembers are not passengers. Their presence on a flight is in direct support of, or associated with, the flight or mission that the flight is supporting. Examples of qualified non-crewmembers include, but are not limited to, media representatives observing the mission, scientists conducting in-flight experiments, and mechanics or mission managers who support the mission or flight on the ground.

3.5 Ground Training

Each primary crewmember must receive ground training as specified in section 4.13.

3.6 Readiness Reviews

3.6.1 The readiness reviews may be split into two review categories, a Flight Readiness Review (FRR)/Operations Readiness Review (ORR) and a Mission Readiness Review (MRR). The FRR/ORR focuses on flight operational safety. The MRR focuses on mission operational safety using multiple aircraft and multiple activities to ensure mission success. Program managers shall conduct an MRR when multiple aircraft operations are to be conducted. [115] FRRs/ORRs and MRRs apply to both piloted aircraft and UASs. Prior to conducting an FRR/ORR, each individual aircraft involved in the flight or campaign shall have an approved Certificate of Airworthiness. [116]

3.6.2 Personnel who should attend these reviews include the Safety and Mission Assurance Office, the mission manager and/or Principal Investigator, the Range Safety personnel, the Flight Operations personnel, the ASO, and, in the case of UAS operations, the UAS operator. The chairman of the Center Airworthiness Process Program or a representative shall attend all readiness reviews. [117]

3.6.3 An FRR/ORR reviews the operational requirements for a specific flight or campaign. A supervisory Flight Operations pilot or other Flight Operations supervisory personnel shall chair and approve the FRR/ORR flight authorization. [118] Areas of consideration will include:

a. Science mission requirements.

b. Flight operations procedures.

c. Operational Go/No-Go criteria.

d. Pilot qualifications, flight operations training, and flight manuals.

e. UAS operations requirements.

f. Aircraft configuration.

g. Aircraft maintenance.

h. Science payload and operations.

i. Payload combination.

j. Status of reviews.

k. Science functional flight test plan.

l. Pre-accident and/or incident plan.

3.6.4 An MRR reviews the mission interoperability of multiple aircraft from multiple activities to ensure mission success for a specific flight event or campaign. Activities may be different Centers, other Federal agencies, military services, commercial vendors, or non-NASA aircraft. Prior to conducting an MRR, each aircraft involved in the flight or campaign shall have an approved FRR/ORR. [119]

3.6.4.1 The program/project management of the flight/campaign event shall assign an individual to chair and make the MRR evaluation and who has authorization to proceed with the flight program. [120] The focus of this review is to ensure that the Principal Investigators and the flightcrews or UAS operators have made the coordination and arrangements required to maximize operational safety and ensure mission success. The MRR shall consider the following:

a. Flight experiment and science flight requirements.

b. Organizational and functional chart.

c. Payload status.

d. Flight operations procedures.

e. Aircraft separation/coordination.

f. Communication plan.

g. Inter-Center/interagency communication/coordination plan.

h. Ground operations procedures dealing with hazardous systems.

i. Schedule timeline.

j. Roles and responsibilities.

k. Science coordination requirements.

l. Pre-accident and/or incident notification plan.

m. Liability coverage.

n. Deployment.

o. Logistics.

p. Public affairs/outreach.

q. Mission assurance. [121]

3.6.5 Centers, Component Facilities, and contractors that do not have an aircraft operations department and operate NASA aircraft/UASs shall coordinate with an alternate NASA Center aircraft operations department for FRR/ORR and MRR services and support. [122]

Chapter 4. Mission Management Aircraft Flight Operations

4.1 Purpose

4.1.1 This chapter establishes policies and procedures for management, use, operation, and control of Government aircraft when used or controlled by NASA to transport passengers or cargo. The definition of passengers does not include crewmembers or qualified non-crewmembers who are directly associated with the conduct or purpose of the flight. For example, researchers conducting or observing their experiments aboard the DC-8 are qualified non-crewmembers. A media representative aboard a Space Shuttle training aircraft observing NASA's flight operations for public affairs purposes would also be a qualified non-crewmember. NASA aircraft are defined herein as aircraft owned, leased, chartered, or rented by NASA, in accordance with NPD 7900.4, Aircraft Operations Management, and OMB Circular A-126, Improving the Management and Use of Government Aircraft. MMA flight operations are defined as the use of NASA aircraft to transport passengers or cargo.

4.2 Policy

4.2.1 In compliance with OMB Circular A-126, NASA will not own aircraft exceeding the number, size, and capacity necessary to meet documented mission requirements. NASA aircraft are public aircraft as defined by 49 U.S.C. S 40102 (37), but are operated as civil aircraft when carrying passengers. NASA aircraft are prohibited from carrying passengers when operating as public aircraft. When operated as civil aircraft, maintenance and aircrew standards shall meet the requirements for retention of FAA airworthiness certification and operation. [123] Those requirements must be followed for any NASA mission management flight that carries passengers. The Certificate of Airworthiness shall be displayed per FAR 91.203 (a) and (b). [124] Mission management flights shall be operated and maintained in accordance with FAR parts 21, 39, 43, 61, and 91 subparts A and B. [125] Centers shall develop policies/procedures to operate MMA in accordance with the procedures specified in OMB Circular A-126 and 41 C.F.R., chapter 101-36.4, as well as the provisions of this chapter. [126] Procedures of the International Civil Aviation Organization (ICAO) apply, in lieu of FAR part 91, on international flights.

4.2.2 Mission management flights shall be conducted only in support of activities that constitute the discharge of NASA's official responsibilities and only when the aircraft is not otherwise scheduled for "Mission Required" or "Required Use" flight operations. [127] NASA employees shall not use mission management flights if commercial airlines, charter aircraft service, or ground transportation are reasonably available to meet the mission need, unless the flight is cost justified in accordance with OMB Circular A-126 and this chapter. [128] Mission management flights may be conducted for the transportation of authorized personnel on official Government business in accordance with OMB Circular A-126. Such travel may be approved only after following all requirements of this chapter.

4.2.3 Flights that require excessive deadheading or involve long, unproductive layovers shall be avoided, absent special emergency situations. [129] Whenever practicable, inter-Center airlift requirements shall be combined. [130]

4.2.4 Each passenger traveling aboard NASA mission management flights must be a U.S. Government employee or contractor on official U.S. Government business and have either an approved NASA travel authorization in accordance with NASA directives or a travel authoriza-tion approved by another Federal agency or Congressional committee. Travel authorized by another Federal agency or Congressional committee also shall be approved by an Official-in-Charge of a Headquarters Office or a NASA Center Director. [131] Flight crewmembers on mission management flights may be considered as passengers for cost justification purposes when they have either an approved NASA travel authorization in accordance with NASA directives or a travel authorization approved by another Federal agency or Congressional committee for purposes or activities beyond their crew flight duties. The names of the passengers and purpose of travel for such passengers shall be documented in the mission management flight request form. [132] Per 41 C.F.R., part 300-3.1, contractors working under a contract with an executive agency are considered Federal travelers and may travel on a Government aircraft.

4.2.4.1 In special emergency situations that are approved by the Assistant Administrator for the Office of Infrastructure and Administration or at the Center Director level, other persons may be permitted to travel aboard NASA mission management flights for emergency or humanitarian purposes or on a "space available" and cost-reimbursable basis. Reimbursement by nonofficial travelers must comply with section 4.7 of this chapter.

4.2.5 All passengers shall be manifested on NASA Form 1269, Flight Itinerary and Passenger Manifest. [133] Prior to departure of any mission management flight, the PIC shall certify the accuracy of the manifest and file a copy with a responsible ground agency such as a military, civil, or NASA operations office. [134] The PIC is relieved of the requirement to provide the manifest if a NASA official has been designated as the ground coordinator for the flight with responsibility for maintaining the manifest.

4.2.6 NASA mission management flight operations shall be conducted under the cognizance of the Assistant Administrator for the Office of Infrastructure and Administration. [135]

4.2.7 The Assistant Administrator for the Office of Infrastructure and Administration shall designate NASA MMA. [136]

4.3 Classification of MMA Use

4.3.1 Required Use. Mission management flights may be classified as Required Use only if the use of Government aircraft is required because of bona fide communications or security needs or exceptional scheduling requirements. Required Use designation shall be controlled solely by the NASA Administrator and approved according to section 4.4.2 of this chapter. [137]

4.3.2 Mission Required. Mission management flights may be classified as Mission Required only when failure to use a NASA MMA would have a clear, negative impact on a NASA operational mission, prevent timely response to an aircraft or spacecraft accident, or threaten

the health and safety of NASA personnel, and only when such travel could not be conducted using commercial airlines, charter aircraft service, or ground transportation to fulfill that mission need. All passenger travel that can reasonably be performed using commercial airlines, charter aircraft service or ground transportation to meet the mission need may not be designated as Mission Required. Classification of a mission management (passenger or cargo) flight as Mission Required requires approval from the Assistant Administrator for the Office of Infrastructure and Administration before the flight and shall be coordinated with the HQ AMD. [138] Refer to section 4.4 of this chapter for approval procedures. Mission management flights also may be designated as Mission Required for nontravel activities that support NASA's official responsibilities. Such activities include, but are not limited to, training, evacuation (including medical evacuation), search and rescue, aeronautical research, space and science applications, and other such non-travel activities as cited in OMB Circular A-126. Mission Required use may not include official travel to give speeches, attend conferences or meetings, or make routine site visits. Cost justification in accordance with OMB Circular A-126 is not required for Mission Required flights.

4.3.2.1 Flights can only be designated as Mission Required if such travel cannot be conducted using commercial airlines, charter aircraft service, or ground transportation to fulfill that mission need. Examples of Mission Required MMA flights include, but are not limited, to the following:

International Space Station Program

a. Return International Space Station crews after landing.

b. Provide transportation for emergency response to in-space operations problems and unexpected events.

Space Shuttle Program

c. Provide emergency transportation capability for KSC shuttle launch/landing rapid response team for each shuttle launch.

d. Provide transportation capability for initial response to space vehicle post-mishap investigations.

e. Needed for emergency response to in-space operations and unexpected events. (unscheduled and time-critical events)

f. Provide transportation of the dependent families of the astronaut crewmembers to and from launches and landings.

g. Provide transportation for prime flight crewmembers to/from launch site during pre-launch countdown and post-launch activities.

Science Programs

h. r aircraft grounded off station due to maintenance problems.

i. Return hardware and data from the landing site of remotely operated space probes.

j. Transport equipment to support flight research for unscheduled and time-critical events to accommodate tight launch schedules.

k. Provide contingency, fast-response capability for launch and search and recovery operations for sounding rockets launched from the Wallops range.

Natural Disaster Response

l. Hurricane and other natural disaster evacuation and response to protect NASA personnel and property.

Table 4-1 Mission Requirements

4.3.3 NASA mission management flights that are not classified as Required Use or Mission Required are classified as Other Official Travel. Agency official travel will normally be accomplished using commercial airlines or available means of ground transportation. Travel on mission management flights that are designated as Other Official Travel must be authorized in advance on a trip-by-trip basis as detailed in section 4.4. NASA employees shall not use mission management flights for Other Official Travel if commercial airline, charter aircraft service, or ground transportation is reasonably available, unless the flight is cost justified in accordance with OMB Circular A-126 and this chapter. [139]

4.3.4 Examples of Other Official Travel include, but are not limited to, the following:

a. Travel to give speeches.

b. Travel to accept awards.

c. Travel to make routine site visits.

d. Travel to attend NASA-sponsored meetings, including meetings for Flight Readiness Reviews, Launch Minus-2, Launch Minus-1, launch or landing activities, launches of other NASA-related payloads, launch recovery operations, Soyuz launch and recovery operations, NASA advisory committees, councils and board meetings, professional conferences, or contractor conferences.

4.3.5 Other Official Travel that is not Required Use or Mission Required, as defined in 4.3.3 above, shall be authorized only when either:

4.3.5.1 No commercial airline or aircraft (including charter) service is reasonably available (i.e., able to meet the traveler's departure or arrival requirements within a 24-hour period), unless extraordinary circumstances require a shorter period to effectively fulfill Agency requirements. (When using "no commercial airline or aircraft service is reasonably available" to justify the use of mission management flights, actual airline schedule information shall be provided as part of, and attached to, the aircraft request.) [140] OR

4.3.5.2 The actual cost of using a Government aircraft is not more than the cost of using commercial airline or aircraft (including charter service). [141] Such cost justification shall be computed consistent with section 4.4.5.2 of this chapter. [142]

4.3.6 Mission Required or Required Use flights (certified under the terms of section 4.4) may transport passengers on Other Official Travel when space is available and such travel is approved in strict compliance with this chapter. Under these circumstances, such mission management flight use may be presumed to result in cost savings to the U.S. Government, and a cost justification is not required and should not be completed on NASA Form 1653 for the flight.

4.3.7 Use of PS or R&D aircraft for passenger transportation purposes, regardless of travel classification category, shall follow the same requirements as used for all other mission management flights, including compliance with 41 C.F.R. 101-37 and OMB Circular A-126, flight request and approval using NASA Form 1653, cost justification on NASA Form 1653 as required, and obtaining travel authorization approvals. [143] When operated as civil aircraft, maintenance and aircrew standards shall meet those required for retention of FAA airworthiness certification and operation and shall be followed for any NASA mission management flight that carries passengers. [144] The Certificate of Airworthiness shall be displayed per FAR 91.203 (a) and (b). [145] Centers shall exercise caution to ensure that aircraft are returned to their FAA-certificated configuration after being modified for Program Support or Research purposes. [146] Refer to section 4.9 of this chapter for specific policies and procedures for flying passengers on Research or Program Support aircraft.

4.3.8 Nonofficial travel on NASA mission management flights is the use of remaining aircraft seating capacity for nonofficial purposes on a flight that is scheduled for official Government business. Nonofficial travel on NASA mission management flights shall be authorized only when all the following conditions are met:

a. The aircraft is already scheduled for use for an official purpose.

b. Such nonofficial travel use does not require a larger aircraft than needed or alteration of flight itinerary for the official purpose.

c. Nonofficial travel use results only in minor additional cost to the Government. [147]

4.3.8.1 All nonofficial travelers shall reimburse the U.S. Treasury in accordance with section 4.7. [148]

4.3.9 The Center Director shall certify, in writing, that nonofficial travel on a scheduled flight has met the above conditions. [149] The Center shall retain this certification for a minimum of two years. [150] In an emergency situation, prior verbal approval by the Center Director with an after-the-fact written certification is permitted.

4.4 Approval of Flights

4.4.1 All flights with passengers aboard NASA aircraft assigned to a Center shall be reviewed by the Center Chief Counsel for compliance with 41 C.F.R., part 101-37 and OMB Circular A 126, and approved in advance by the Center Director. [151] In the case of aircraft assigned to HQ, those flights shall be reviewed by the General Counsel or Deputy General Counsel and approved in advance by the Assistant Administrator for the Office of Infrastructure and Administration. [152] Additionally, all flights classified as Other Official

Travel that have Senior Federal Officials aboard shall be reviewed by the General Counsel or the Principal Deputy General Counsel and approved in advance by the appropriate NASA HQ or Center approval authority. [153] This review and approval authority may not be delegated.

4.4.2 Mission management flights also shall be approved in advance, in writing, and generally on a trip-by-trip basis. [154] The Administrator shall in each instance determine the appropriateness of Required Use flights following a finding of compliance with OMB Circular A-126 requirements by the General Counsel or Principal Deputy General Counsel (Administration and Management). [155] While the Administrator may make a blanket determination that all use of NASA aircraft by certain employees, or travel in specified categories, qualifies as Required Use travel, such determinations shall likewise be in writing, be determined to be compliant with OMB Circular A-126 requirements by the General Counsel or Principal Deputy General Counsel (Administration and Management), and set forth the justification for that determination. [156]

4.4.2.1 The Center Director must complete the following when a member of the flightcrew is also considered a passenger:

a. The justification shall be annotated in the remarks section of NASA Form 1653. [157]

b. The flightcrew member shall have either a NASA travel authorization approved in accord-ance with NASA directives or a travel authorization approved by another Federal agency or Congressional committee for purposes or activities beyond their crew flight duties. [158]

c. The flightcrew member shall be listed as a passenger on Form 1653. [159]

d. If the flightcrew member is a Senior Federal Official, a family member of such Senior Federal Official, or a non-Federal traveler, the flight request shall be reviewed by the General Counsel or Principal Deputy General Counsel. [160]

4.4.3 Flights classified as Mission Required where NASA personnel are traveling to meet mission requirements also shall be reviewed by the General Counsel or Principal Deputy General Counsel (Administration and Management) and approved in advance by the Assistant Administrator for the Office of Infrastructure and Administration. [161] Refer to figure 4-1 for the approval process flow chart. The Assistant Administrator for the Office of Infrastructure and Administration shall ascertain prior to authorizing the flight that the purpose of the trip is for Mission Required travel as described in section 4.3.2. [162] Should special emergency situations preclude pre-flight review and approval, immediate action to review and approve the flight shall be taken as soon as practicable following the flight. [163]

4.4.3.1 Flights classified as Mission Required conducted on Research or Program Support aircraft, where passengers are aboard but the primary purpose of the flight is not passenger transport, may be approved at the Center Director level with Center Counsel review. General Counsel shall review the flight in advance if a Senior Federal Official, families of such Senior Federal Officials, or non-Federal travelers are passengers. [164] Refer to figure 4-2 for the approval process flow chart (figure 4-4, if a Senior Federal Official is a passenger). Cost justification is not required. Authorization shall be coordinated with the HQ AMD. [165] An example of such a flight would be a Program Support flight to provide

photographic chase on a research object, or aircrew training to meet minimum proficiency standards. In this example, the primary purpose of the flight is not passenger transport. However, in addition to the crewmembers and qualified non-crewmembers directly involved with the flight's primary mission, support personnel or other official travelers may be carried as passengers providing that all other applicable provisions of this chapter have been met. An MMA Flight Request (NASA Form 1653) is required, and the passenger manifest (NASA Form 1269) shall clearly distinguish aircrew from passengers. [166] The remarks section of the NASA Form 1653 shall indicate what training and for whom the flight is being conducted. [167] NOTE: If minimum aircrew currency requirements have been met prior to the commencement of the flight for all of the aircrew assigned to a flight, aircrew training cannot be the primary purpose of a flight when carrying passengers.

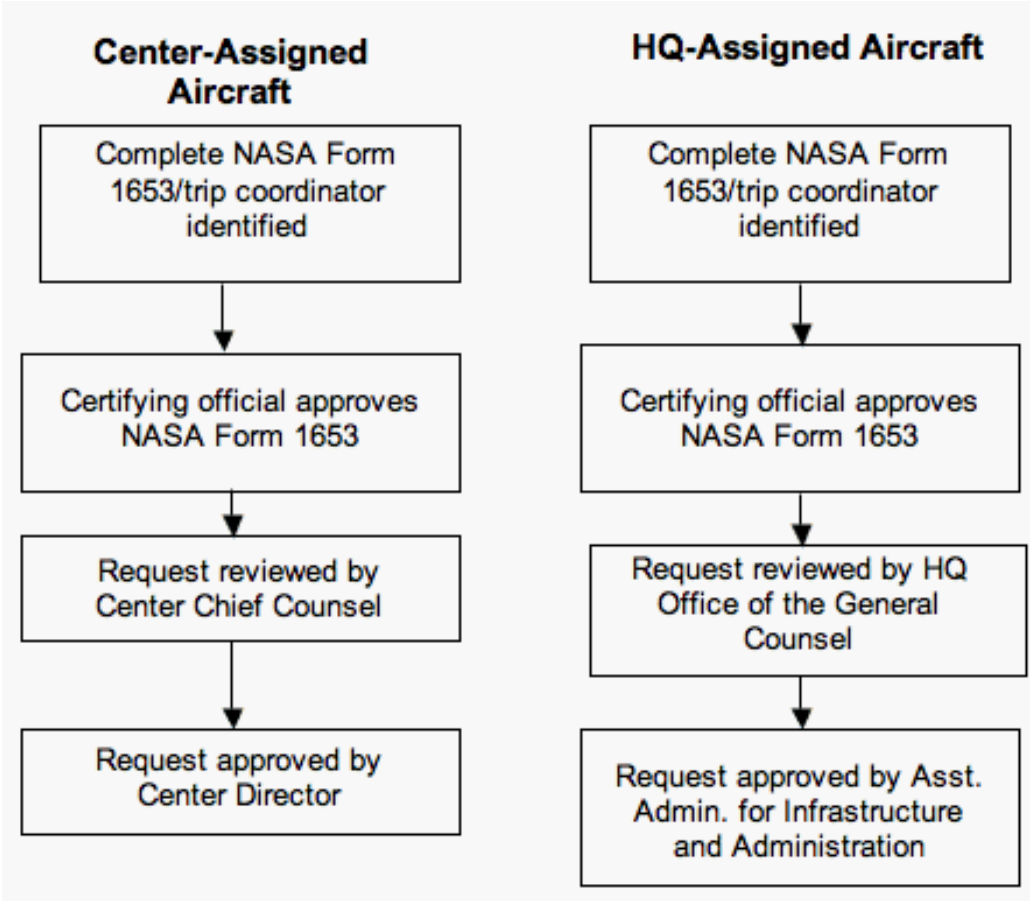

Figure 4-1 Mission Required Travel Where Passenger Transportation Is the Primary Purpose of the Flight

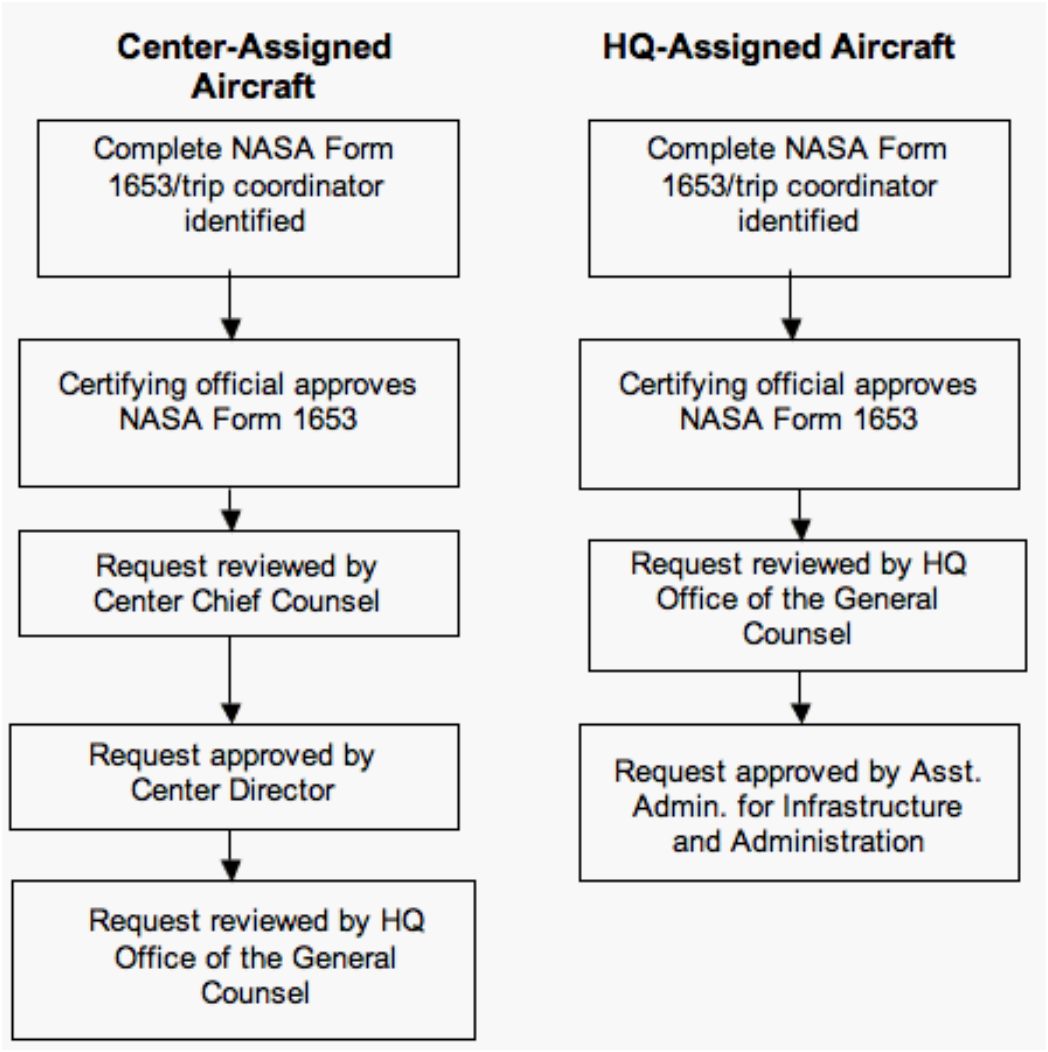

Figure 4-2 Mission Required Travel Where Passenger Transportation Is Not the Primary Purpose of the Flight

4.4.4 For the approval process for Other Official Travel, refer to figures 4-3 and 4-4. Travel by the following categories of people must be authorized in advance and in writing when traveling aboard mission management flights on Other Official Travel, and their status shall be annotated on the flight request and manifest:

a. Senior Federal Officials.

b. Members and families of such Senior Federal Officials.

c. Non-Federal travelers. [168]

4.4.4.1 Senior Federal Officials are persons who meet one of the following definitions:

a. Employed at a rate of pay specified in or fixed according to subchapter II, chapter 53 of Title 5 of the U.S. Code;

b. Employed in a position in an executive agency, including any independent agency, at a rate of pay for Level I of the executive schedule or employed in the Executive Office of the President (EOP) at a rate of pay for Level II of the executive schedule;

c. Employed in a position in an executive agency that is not referred to in clause (i) of Section 1009 of Title 37 of the U.S. Code (other than a position that is subject to pay adjustment under Section 1009 of Title 37 of the U.S. Code) and for which the basic rate of pay, exclusive of any locality-based pay adjustment under Section 5304 of Title 5 of the U.S. Code (or any comparable adjustment pursuant to interim authority of the President), is equal to or greater than the rate of basic pay for the senior executive service (SES) under Section 5382 of Title 5 of the U.S. Code;

d. Appointed by the President to a position under Section 105(a)(2)(A), (B), or (C) of Title 3 of the U.S. Code or by the Vice President to a position under Section 106(a) (1) (A), (B), or (C) of Title 3 of the U.S. Code; or

e. Civilian officials appointed by the President with the advice and consent of the Senate and civilian employees of the EOP including senior executive branch officials. Generally, these officials are persons employed by the White House and executive agencies, including independent agencies, at a rate of pay equal to or greater than the minimum rate of basic pay for the SES. Active duty military officers are exempted from this definition.

4.4.4.2 Authorizations for Other Official Travel flights with Senior Federal Officials, families of such Senior Federal Officials, and non-Federal travelers aboard shall be:

a. Reviewed in advance on a trip-by-trip basis by the Center Chief Counsel; [169]

b. Approved by the Center Director; [170]; and

c. Reviewed by the NASA General Counsel or Principal Deputy General Counsel (Administration and Management). [171]

4.4.4.3 At NASA HQ, all flights shall be reviewed by the General Counsel or Principal Deputy General Counsel (Administration and Management) and approved in advance by the Assistant Administrator for the Office of Infrastructure and Administration. [172] In special emergency situations, an after-the-fact written certification is permitted. Other Official Travel flights on Center-assigned aircraft with no Senior Federal Officials aboard shall be reviewed by the Center Chief Counsel and approved by the Center Director without HQ review. [173]

Figure 4-3 Approval Flow for Other Official Travel Without Senior Federal Officials, Families of Such Senior Federal Officials, or Non-Federal Travelers Aboard

Figure 4-4 Approval Flow for Other Official Travel With Senior Federal Officials, Families of Such Senior Federal Officials, or Non-Federal Travelers Aboard

4.4.5 When the mission management flight is for Other Official Travel, the approving official shall determine that one of the following criteria has been satisfied:

4.4.5.1 No commercial aircraft or airline service is reasonably available in accordance with paragraph 4.3.4.1.

4.4.5.2 The actual cost of mission management flights does not exceed the cost of using commercial airlines or aircraft (including charter service). For such "cost-justified flights," the cost of using commercial airline or aircraft services for justifying the use of Government aircraft shall:

a. Be the current Government contract fare or price or the lowest fare or price known to be available for the trip(s) in question.

b. Include any differences in the costs of any additional ground or air travel, per diem and miscellaneous travel (e.g., taxis, parking), and lost employee work time (computed at gross hourly costs to the Government, including benefits) between commercial air, charter air service, and Government aircraft. To capture the cost, including fringe benefits, of the employee's lost work time, a multiplier of 1.3285 must be applied to the locality-adjusted hourly salaries of the individual travelers for the additional travel time. The hourly salaries of the travelers are determined by dividing the applicable current average annual salaries that are provided by the NASA Workforce Web site by 2,087. Selecting the "Average Salaries by Occupation and Center (table)" view will provide access to the necessary data to determine average salaries by occupation and grade for each Center. While Federal salary data can be found at many other locations, the NASA Workforce Web site is the official NASA source. Travel time is defined as the time required to travel from the office or home until arrival at the business location or hotel, whichever is earliest. [174]

4.5 Responsibilities Associated with Mission Management Flight Operations

4.5.1 The Assistant Administrator for the Office of Infrastructure and Administration shall have the following responsibilities:

4.5.1.1 Approving policies and other matters involving NASA mission management flights (except those specifically outlined above) and ensuring that the number of NASA-owned aircraft and their capacity to carry passengers and cargo does not exceed the level necessary to meet NASA's mission requirements. [175]

4.5.1.2 Coordinating acquisition, assignment, or disposition of aircraft whose primary purpose is the conduct of mission management flights with the appropriate Associate Administrators and Center Directors in accordance with OMB Circular A-76. [176]

4.5.1.3 Annually reviewing mission management flight requirements, use, and associated costs, including variable cost rates for each aircraft used to conduct mission management flights. [177]

4.5.1.4 Periodically reviewing the need for all NASA aircraft whose primary purpose is mission management flight operations, and the cost effectiveness of NASA mission management flight operations in accordance with the requirements of OMB Circular A-76. Each such review of NASA-owned aircraft whose primary purpose is mission management flight operations shall be submitted to the General Services Administration (GSA) when completed and to Office of Management and Budget (OMB) with NASA's next budget submission. [178]

4.5.1.5 Ensuring that current (by fiscal year) variable cost rate for each aircraft utilized to conduct mission management flights is used by all NASA officials who operate and account for NASA mission management flights to calculate the flight-by-flight cost justification required by OMB Circular A-126. [179]

4.5.2 Center Directors are responsible for the safe and efficient operation of mission management flights conducted by their assigned aircraft. Specifically, Center Directors shall:

4.5.2.1 Ensure that aircraft are used properly and that the functions, including contract functions, performed by their aircraft comply, at a minimum, with NASA, FAA, OMB, and other Federal requirements, policies, and procedures. [180] Center Directors may establish more restrictive local standards where circumstances warrant, following coordination with the Assistant Administrator for Infrastructure and Administration.

4.5.2.2 Ensure compliance with 41 C.F.R., part 101-37 and OMB Circular A-126. [181]

4.5.2.3 Approve the use of their assigned aircraft to conduct mission management flights where passenger transport is not the primary mission. [182]

4.5.2.4 Designate aircrew to conduct mission management flights and ensuring continuing compliance with all governing regulations. [183]

4.5.2.5 Establish variable cost rates for aircraft under their control that are, or may be, used for passenger transportation. The rate will be developed using OMB Circular A-126, attachments A and B, incorporating the most recent 12 months of historical cost data available and shall be used to determine the cost justification for MMA flight requests. The rate shall be reported to the HQ AMD not later than September 15 of each year and cannot be used until approved by that office. [184]

4.5.2.6 Annually review and document the Center's continuing need for aircraft whose primary purpose is the transport of passengers and the cost-effectiveness of such aircraft operations, as required by OMB Circular A-126 and reflected in the NASA Financial Management Requirements and guidance from the HQ AMD. Content of this review must include, in narrative format, a comparison of the past years' use with future requirements. Upon completion of the annual review, a copy shall be forwarded to the HQ AMD not later than October 31 of each year. [185] When Government ownership of an aircraft is no longer justified, Center Directors shall identify such aircraft to the Assistant Administrator for Infrastructure and Administration for reassignment or disposal. [186]

4.5.2.7 Submit a monthly report of mission management flight data to the HQ AMD to arrive not later than the 20th of the next month. [187] This data must include all available mission management flight and request records for NASA aircraft under the control of the Center Director and must reflect every flight flown by aircraft that has been, or may be, approved to transport passengers regardless of whether the passengers were aboard that flight. At a minimum, the following shall be provided:

a. NASA Form 1653, Mission Management Flight Request.

b. NASA Form 1269, Flight Itinerary and Manifest.

c. Cost Calculation Spreadsheet.

d. NASA Aircraft Management Information System (NAMIS) Form 1672, Aircraft Log. [188]

4.5.2.8 Certification documentation demonstrating compliance with paragraph 4.3.5 for any

nonofficial travel use and documentation of the required reimbursement described in section 4.7 shall be included in the monthly mission management flight data submission. This responsibility may be delegated. [189]

4.5.3 The Director of the HQ AMD is responsible for the following:

4.5.3.1 Providing oversight, functional management, and direct staff support to the Administrator concerning Agency-wide policies, procedures, and guidelines for the management and conduct of mission management flights and Center compliance with NASA and OMB requirements.

4.5.3.2 Developing and coordinating plans for the acquisition, assignment, and disposition of NASA aircraft whose primary purpose is passenger transport.

4.5.3.3 Developing standard Agency-wide maintenance and operating requirements and policies, including minimum training and qualification requirements for aircrew and maintenance personnel.

4.5.3.4 Coordinating periodic meetings with Center Aircraft Operations Chiefs and Maintenance Chiefs to review and update Agency-wide operations and maintenance requirements, policies, and procedures.

4.5.3.5 In conjunction with the chairman, IAOP, coordinating and participating in the conduct of operational reviews to ensure the adequacy and standardization of procedures, aircrew training and qualification programs, and aircraft maintenance and inspection programs at Centers operating mission management flights.

4.5.3.6 Evaluating cost and utilization data for NASA aircraft used to conduct passenger transport.

4.5.3.7 Providing an annual summary analysis of all cost and utilization data for mission management flight operations to the Assistant Administrator for Infrastructure and Administration.

4.5.3.8 Providing Centers with guidance and assistance in the development of aircraft variable cost rates for use in accomplishing cost comparisons.

4.5.3.9 Reviewing and approving Center-derived variable cost rates for MMA.

4.5.3.10 Maintaining a centralized database of mission management flight operations documentation to monitor usage, aircraft costs, and compliance with NASA and OMB requirements.

4.5.3.11 Providing an annual report to the Assistant Administrator for Infrastructure and Administration on the quality of Agency-wide compliance with NASA and OMB requirements for mission management flight operations no later than November 15 of each year.

4.5.3.12 Conducting annual audits of Center mission management flight operations documentation.

4.5.4 The Inter-Center Aircraft Operations Panel

4.5.4.1 The IAOP performs Agency-wide coordination and communication to recommend requirements, policies, and operational improvements that can be used by the NASA Centers to improve local operations policies and procedures and by the HQ AMD to improve Agency policies, procedures, and guidelines.

4.5.4.2 For each aircraft type used to conduct mission management flights, the IAOP chairperson may establish operations and maintenance subpanels with responsibility for standardizing aircrew and maintenance procedures, establishing aircrew and maintenance training/qualification standards, and conducting airworthiness reviews. For subpanels, the IAOP chair will ensure the following.

a. Subpanel members shall be Chiefs of Aircraft Operations and Chiefs of Aircraft Maintenance or their designees, as well as a representative from the HQ AMD who shall act as permanent executive secretary. [190]

b. Subpanels shall be convened at least annually in formal meetings; however, the subpanels shall act as standing committees subject to call by the chairperson to review urgent business. Informal meetings may be conducted by teleconference. [191]

c. Subpanels, with IAOP chairperson concurrence, shall forward their recommendations through the HQ AMD to the Assistant Administrator for Infrastructure and Administration for final approval. Headquarters-approved recommendations shall be considered directive in nature and shall be reflected in NASA policy documents. [192]

4.5.5 Flightcrew members

4.5.5.1 Maintaining the highest standards of safety is the primary concern of all crewmembers. Other concerns, such as passenger service, courtesy, promptness, and reliability are important but must always be secondary to safety. All crewmembers shall comply with the provisions set forth in this NPR and with FAA and OEM publications for their aircraft and other applicable directives, regulations, and instructions. [193]

4.5.6 Pilot in Command. A fully qualified pilot shall be designated as PIC and charged with the responsibility of conducting each NASA mission management flight. [194]

4.5.6.1 The PIC is responsible for exercising complete authority, without limitation, over the command and supervision of assigned crewmembers during flight and crew duty time.

4.5.6.2 The PIC is solely responsible for accomplishing the mission assigned to the aircraft, for all facets of its operations, and for exercising final authority over the safety of the aircraft and its passengers. The PIC will make the decision to delay or divert a flight for operational reasons such as weather, aircraft conditions, or pilot fatigue. The PIC will not be overruled by other persons embarked. A decision by the PIC to delay or divert a flight for the above reasons or based on safety concerns will not be the basis for disciplinary action.

4.5.7 Second in Command (SIC). The pilot assigned to duty as SIC during flight must be qualified as either a PIC or SIC as specified in paragraph 4.11.4. It is the SIC's responsibility to assist the PIC and to be able to assume command in the event of the PIC's absence or incapacitation.

4.5.7.1 A SIC may, at the discretion of the PIC, fly from the left seat or right seat on

missions (such as ferry or training missions) when no passengers are on board. A SIC will not make takeoffs or landings from either seat with passengers on board. However, Center Chiefs of Flight Operations may grant, in writing, authority for a PIC to allow a SIC to execute landings with passengers aboard. The final approval authority for such operations remains with the PIC for each flight.

4.6 Reporting Requirements

4.6.1 The HQ AMD will ensure strict compliance with the following reporting requirements:

4.6.1.1 NASA's aircraft programs must be included in NASA's Management Control Plan and will comply with the internal control requirements of OMB Circular A-123. Any material weaknesses found must be reported in the next annual internal control report to the President and Congress.

4.6.1.2 OMB Circular A-76 reviews will be completed when required and submitted to GSA and OMB with the Agency's next budget submission. These reports will include plans for disposition of any aircraft not justified in the review or identification of such additional aircraft as may be required.

4.6.1.3 On a semiannual basis, NASA reports to GSA each mission management flight for "Other Official Travel" by Senior Federal Officials, staff of the Executive Office of the President, members of the families of such officials, and any non-Federal travelers (except as authorized under 10 U.S.C. 4744 and regulations implementing that statute). Such reports will be in a format as specified by GSA and list all such travel conducted during the preceding six-month period. The report must include, at a minimum:

a. The name of each such traveler.

b. The official purpose of the trip.

c. Destination(s).

d. For travel in which it was stated that a mission management flight would be less expensive than a commercial carrier, the allocated share of the full operating cost of each trip and the corresponding commercial cost for the trip. (Reports on classified trips will not be reported to GSA but must be maintained by the agency using the mission management flights and must be available for review as authorized.)

4.6.1.4 Records of all mission management flight operations shall be retained for at least two years and must include, at a minimum:

a. The tail number of the plane used.

b. The date(s) used.

c. The name(s) of the pilot(s) and flightcrew.

d. The purpose(s) of the flight.

e. The route(s) flown.

f. The names and status of all passengers on all legs of the mission. [195]

4.6.1.5 When mission management flights are used to support Other Official Travel, evidence that the applicable provisions of OMB Circular A-126 have been satisfied is required.

4.6.2 Center Directors shall ensure strict compliance with the following reporting requirements:

4.6.2.1 Monthly submission of mission management flight data to the HQ AMD as required in paragraph 4.5.2.7.

4.6.2.2 Annually reviewing and documenting the Center's continuing need for aircraft whose primary purpose is the transport of passengers and the cost-effectiveness of such aircraft operations, as required by OMB Circular A-126 and reflected in the NASA FMR and guidance from the HQ AMD. Content of this review shall include, in narrative format, a comparison of the past years' use with future requirements. [196] Upon completion of the annual review, a copy shall be forwarded to the HQ AMD not later than October 31 of each year. [197]

4.6.2.3 Establishing variable cost rates for each fiscal year for aircraft under their control that are, or may be, used for passenger transportation. This rate is to be used to determine cost justification for MMA flight requests and shall be reported to the HQ AMD not later than September 15 of each year. [198]

a. The variable rate will be developed per OMB Circular A-126, attachments A and B, using the most recent 12 months of historical cost data available. The Center variable rate must be approved by HQ AMD prior to being applied at the beginning of each FY. If, during the FY, a Center needs to adjust the variable rate, substantiation must be submitted and approved prior to being applied.

4.7 Reimbursement for Nonofficial Travel Use

4.7.1 Reimbursement for nonofficial travel use shall be made in advance of the flight for travel on FAA aircraft, consistent with current FAA procedures. [199]

4.7.2 Reimbursement for nonofficial travel use of NASA-owned or -controlled aircraft shall be made in advance of the flight. [200] Travelers aboard such flights must reimburse the Agency at the full commercial coach fare for the most direct route possible between the origin and destination, except: (a) as authorized under 10 U.S.C. 4744 and regulations implementing the statute and (b) by civilian personnel and their dependents in remote locations (i.e., locations not reasonably accessible to regularly scheduled commercial airline services).

4.7.3 Reimbursement will consist of a noncash payment by personal check made payable to NASA for the amount as determined by the local NASA Travel Office. The check will be submitted to the Customer Payment Processor in the Center's Accounts Receivable office. Receipt of the reimbursement will be fully documented and attached to the Mission Management Flight Request NF 1653. Any flight involving nonofficial travelers shall

require notification to the HQ AMD prior to the flight to ensure application of the Agency-wide procedures for reimbursement. [201]

4.8 Operations

4.8.1 NASA mission management flights are public aircraft, as defined by 49 U.S.C. 40102 (37), but are operated as civil aircraft when carrying passengers.

4.8.2 R&D or PS aircraft used to conduct mission management flights shall meet the FAA certification standards required of mission management flights. [202]

4.8.3 Airworthiness of NASA mission management flights shall, at a minimum, meet the standards set forth in the Federal Aviation Regulations for similar business-type aircraft. [203] Aircraft whose primary or secondary purpose is the transport of passengers shall be maintained as required for retention of FAA airworthiness certification. [204]

4.8.4 The cost of operation and the utilization of mission management flights shall be reported in accordance with Financial Management Manual 9353-6 (RCS-10-0000-00271) and OMB Circular A-126. [205]

4.9 Use of Research or Program Support Aircraft for Mission Management Flight Purposes

4.9.1 NASA-owned and -controlled aircraft, including lease and charter, whose primary purpose is to meet mission requirements for research or program support, are public aircraft and are not authorized to carry passengers, even if the classification of the flight is Mission Required, without written approval from the Assistant Administrator for Infrastructure and Administration prior to such use. Approval shall be coordinated with the HQ AMD. [206] Once approval for such use has been obtained, Center Directors may approve Mission Required flights on those specifically authorized aircraft, subject to the reporting procedures of this chapter and the letter of authorization. Absent such specific authorization, personnel aboard aircraft operated as public aircraft is limited to crewmembers or qualified non-crewmembers. The use of a NASA R&D or PS aircraft to provide passenger transportation shall be restricted to circumstances where such use does not conflict with program support or research functions. [207] Strict compliance with this chapter and with OMB Circular A-126 is mandatory. Such use will only be approved subject to the following:

a. When using an R&D or PS aircraft for MMA, the aircraft must be in a valid FAA-certificated configuration.

b. When mission management flights are not readily available or when such use would be impractical, e.g., when using an available mission management flight would create excessive empty flights--deadheading--or would exceed crew duty restrictions.

c. The same cost comparisons required for mission management flights, as required by paragraphs 4.1 through 4.4.

d. When such use has been approved by the Center Director and the Assistant Administrator

for Infrastructure and Administration.

4.9.1.1 Centers shall document the justification for and approval of each flight used for mission management purposes and retain the documentation for two years. [208] Additionally, every flight in such aircraft, including flights without passengers, must be accounted for in monthly documentation provided to the HQ AMD as described in section 4.6.2.1 of this chapter.

4.10 Waivers and Supplements

4.10.1 Waivers. When deviations from this NPR are necessary, Center Directors shall submit requests for waivers to the Assistant Administrator for Infrastructure and Administration. [209] Written approval shall be obtained before implementing procedures that are less restrictive than those contained in this NPR. [210]

4.11 Flightcrew Qualifications

4.11.1 Designation. Prior to assigning personnel to flightcrew duties on NASA MMA, the requirements contained in this chapter must be met. The crewmember must be designated, in writing, to the respective crew position, and required training must be completed and documented in the individual's training file.

4.11.2 Training File. A training file shall be maintained for each flightcrew member. [211] This file must contain all documentation pertaining to crew qualification and training. The documents may be retained by the crewmember upon termination of the crewmember's assignment. The file will contain the following minimum documentation:

4.11.2.1 Copies of certificates of professional and medical qualifications, e.g., copies of pilot's, flight engineer's, or mechanic's licenses and a copy of the letter designating the individual to his/her current crew position.

4.11.2.2 A list of ground training accomplishments (including simulator training) indicating dates, location, and amount of training. A record of refresher training must be maintained for the past two calendar years.

4.11.2.3 A list of flight training accomplishments and flight evaluations for the past two calendar years.

4.11.3 Medical Prerequisites. Pilots of MMA shall possess a current FAA First Class Medical Certificate. [212] Flight Maintenance Technicians shall possess a valid FAA Third Class Medical Certificate or NASA medical certificate issued within the past 12 months by a NASA-approved medical examiner. [213] Examinations conducted by non-NASA Aircrew Medical Examiners (AME) will require a records review by a NASA Occupational Health Clinic physician prior to recommendation to the Center Director.

4.11.4 PICs/SICs shall possess an FAA Airline Transport Pilot (ATP) Certificate with appropriate category, class, and type rating in the aircraft assigned. [214] To be designated an aircraft commander, the pilot shall meet the following minimum flight experience

requirements:

a. 2,500 pilot hours (500 hours multiengine).

b. 100 pilot hours in type. [215]

4.11.5 Instructor pilots shall be selected by the Center Chief of Flight Operations from highly qualified PICs who have demonstrated the skill, maturity, and temperament to perform instructor duties. [216] Instructor pilots will conduct all pilot flight checks unless the Center designates Flight Examiners for that purpose.

4.11.6 Flight Examiner Pilots/Flight Examiner Maintenance Technicians. Centers may designate highly qualified instructor pilots and flight maintenance technicians as flight examiners to fulfill Center evaluation requirements.

4.11.7 Flight maintenance technicians shall possess an FAA A&P Certificate. [217]

4.12 Crewmember Training

4.12.1 The MMA training program is established to ensure that each crewmember is adequately trained to perform assigned duties safely and proficiently. To the extent practical, procedures training should be standardized for each type of MMA.

4.13 Ground Training

4.13.1 Survival Training. Each primary crewmember shall receive basic survival training on a one-time basis. [218] Additional survival training shall be required by appropriate Center management for those crewmembers engaged in frequent over-water or remote-area flights. [219] Training received prior to NASA employment, such as military survival training courses, may be credited for this requirement. Newly assigned personnel with no previous survival training shall complete this requirement within 12 months of being assigned to flightcrew duties. [220] Pilots shall not be assigned as PIC until this requirement has been met. [221]

4.13.2 Physiological Training. Prior to initial designation, primary crewmembers shall receive instruction in the physiological aspects of high-altitude flight including altitude chamber indoctrination. [222] Altitude chamber training received prior to initial designation meets this requirement. Refresher training academics shall be accomplished every five years. [223] Refresher altitude chamber training is optional for primary crewmembers not conducting pressure suit operations.

4.13.3 Emergency Egress Training. Prior to initial designation and annually thereafter, each crewmember shall receive emergency egress training on each type of aircraft assigned. [224] Training shall include instruction on the location and operation of normal and emergency exits and cabin emergency equipment, such as fire extinguishers and life vests. [225]

4.13.4 Aircraft Initial Training. Each primary crewmember shall complete an approved formal course of instruction in the type aircraft to be flown, including a study of the systems and procedures applicable to the individual's crew position. [226] The term "formal course"

is defined as one that is provided by a manufacturer, a commercial activity specializing in pilot training (FAR Part 142 Training Center), or other entity approved by the Center Chief of Flight Operations.

4.13.5 Refresher Training. A formal systems training course is required every six months for pilots and every 18 months for flight maintenance technicians. [227] The course must consist of a minimum of seven hours of academic training. At the discretion of the Center Chief of Flight Operations, a seven-hour local refresher ground training course may be substituted for one of the two annual formal systems training courses for highly experienced pilots who are qualified in multiple aircraft and attend multiple emergency procedure training sessions annually or who are single-aircraft qualified and have at least 3 years and 300 hours experience in the specific aircraft type.

4.13.6 Maintenance Technicians shall attend refresher training that address changes to aircraft systems, test equipment, or critical troubleshooting and repair techniques every 24 months. [228]

4.14 Flight Training Phase

4.14.1 Flight training is designed to provide crewmembers with hands-on experience under controlled conditions. Flight training shall be conducted under the supervision of a NASA-designated flight instructor pilot or an FAA-certified flight instructor, either in an approved simulator or in an aircraft. [229] Flight training, except that which is associated with transportation procedures, will not be conducted while passengers are on board.

4.14.2 Initial Pilot Training. Prior to initial designation, each pilot shall receive a minimum of ten hours of flight training, eight hours of which may be conducted in a simulator. [230]

4.14.3 Refresher Pilot Training. In each six-month period, pilots shall receive a minimum of six hours of flight or simulator training. [231] At least one-half of this training must be completed in the pilot's (left seat) position. Because of the safety and efficiency provided by modern visual simulators, maximum use should be made of these facilities to meet this training requirement. With the approval of the Center Chief of Flight Operations, one of the semiannual flight or simulator training requirements may be waived for pilots with three years and 300 hours of experience in type and for temporary pilots serving in an SIC capacity. This can be done only after all other applicable requirements of this NPR have been met and the temporary pilot successfully completes a proficiency and instrument proficiency check in type given by a designated NASA flight instructor.

4.14.4 Flight Maintenance Technician Training. Maintenance technicians perform in-flight duties involving passenger safety aboard certain NASA MMA, such as Gulfstream aircraft. Prior to initial designation, each maintenance technician shall receive training in such areas as traffic awareness and "see-and-avoid" techniques, aircraft servicing, weight and balance, and passenger care. [232] This training may be conducted on a regular passenger mission under the supervision of a fully qualified flight maintenance technician or aircraft commander. Initial training will consist of at least two passenger missions. One mission must include an overnight stop away from the home duty station.

4.15 Overdue Training

With the exception of systems and simulator training, which have a two-month grace period, refresher flight training will be considered overdue if not completed by the end of the month in which it is due. Only crewmembers who have completed their required training shall be used as required crewmembers on any passenger missions. [233]

4.16 Minimum Currency Requirements

4.16.1 Minimum Requirements. In the interest of flight safety and to ensure that all crewmembers have the opportunity to exercise their aeronautical skills and thereby maintain the proficiency level for which they have been trained, the following minimum currency requirements shall be met: [234]

4.16.1.1 Pilots. Table 4-2 sets forth the minimum currency requirements for pilots:

Minimum Currency Requirements for All Pilots in the Preceding 90 Days

	All Types	In Type
Flight Hours	25	
Takeoffs and Landings (Total)	6	3
Takeoffs and Landings (Night)	3	1
Approaches	6	3

Notes:
1. Requirements under "All Types" are not limited to MMA.
2. Total "Flight Hours" may include simulator hours.
3. Instrument hours, approaches, takeoffs, and landings (including night takeoffs and landings) may be accomplished in an FAA- or military-approved (Level C/D) simulator. Approaches must include both precision and nonprecision types.

Table 4-2 Minimum Currency Requirements for Pilots

a. Pilots Qualified in Program Support/MMA Aircraft. Pilots with current qualifications in a Program Support aircraft that is also FAA-certified for MMA use, but infrequently used for that purpose, may perform the duties of PIC and SIC on that aircraft if they meet the currency requirements stated herein. At Centers that operate multiple higher performance aircraft than the MMA and where such aircraft have annual or semiannual simulator and other similar requirements (night landings, approaches, and hours), pilots will be considered to have met the recent experience requirements of paragraph 4.16.1.1.

b. Total pilot/copilot hours may include simulator hours.

c. Instrument hours, approaches, and landings (including night landings) may be

accomplished in an approved visual, motion simulator. Approaches should be evenly balanced between precision and nonprecision.

4.16.2 Flight Maintenance Technicians. To maintain currency, flight maintenance technicians shall have flown at least three passenger missions each calendar quarter, or they must be accompanied by a current flight maintenance technician. [235]

4.17 Overdue Recent Experience

The following apply to pilots overdue for the recent experience provisions of table 4-2:

4.17.1 Increased Minimums. A pilot at the controls who does not meet the 90-day total hour requirements, but is otherwise current, shall increase all instrument approach minimums by 200 feet and 1/2-mile visibility (or the Runway Visual Range equivalent). [236] In no case may the resulting minimums be less than a 400-foot ceiling and 1-mile visibility.

4.17.2 Step-down Qualifications. PICs who are otherwise current but fail to meet the requirements outlined in table 4-2 may revert to SIC status if they are current in their respective positions until the recent-experience provisions for aircraft commander are satisfied.

4.17.3 Multiple Currency. At the discretion of the Chief Pilot, pilots flying multiple types of aircraft who have met the "all types" requirements may satisfy the "in type" currency requirement by flying a training flight with a flight instructor. This training flight shall include a minimum of two instrument approaches, three takeoffs, and three landings. [237]

4.17.4 Night Landing Currency. Pilots not meeting the night-landing currency requirements of table 4-2 cannot conduct night landings with passengers on board, but may be otherwise utilized until the night-landing requirements are satisfied. Night-landing requirements may be accomplished in an approved visual simulator.

4.17.5 Lapse in Qualification. Crewmembers overdue in any recent-experience requirement, except as modified above, are disqualified for assignment as PIC or SIC on passenger flights. Lapse in qualification of up to 90 days requires requalification in items that are deficient or requires a proficiency flight check with an instructor pilot. Lapse in qualification greater than 90 days requires retraining of at least six hours dedicated flight or simulator training as determined by the Center Chief of Flight Operations and requires a formal flight evaluation by an instructor pilot. [238]

4.18 Evaluation Phase

4.18.1 Evaluations. The intent of the NASA flightcrew evaluation program is to objectively evaluate aircrew performance and, thereby, measure the effectiveness of the training program. Designated instructor pilots (IPs) shall administer all flight checks. [239] An IP shall be designated for all flights in which instruction or evaluation is planned. [240]

4.18.2 Annual Proficiency Check. Prior to being designated in their crew position, and annually thereafter, pilots shall complete a proficiency evaluation flight conducted by a

NASA-designated IP or an FAA-designated flight IP. [241] When maintaining qualifications in more than one type of aircraft, an annual proficiency evaluation flight in each aircraft is required. Except for the initial check, proficiency checks may be accomplished in an approved simulator by a NASA IP or an FAA-designated examiner. Flight checks are considered overdue if not completed by the end of the month in which they are due. Pilots with overdue proficiency checks shall be scheduled only on training flights (i.e., non-passenger flights) with an instructor pilot. [242]

4.18.3 Line Checks. Prior to being designated an aircraft commander and annually thereafter, pilots shall complete a line evaluation flight conducted by an IP. [243] When maintaining qualification in more than one type MMA, a line evaluation in each aircraft is required annually. The annual line check requirement may be conducted on typical passenger missions or in a Line Oriented Flight Training (LOFT) program in an approved simulator. Pilots with overdue line checks shall not be scheduled as a PIC until a check is completed. [244]

4.18.4 Documentation. Flight checks conducted by NASA IPs shall be recorded on NASA Form 1615 or Center equivalent, reviewed by the Center Chief of Flight Operations, and filed in the individual's training file. [245] All items indicated on the Form 1615 or Center equivalent will be evaluated during the flight checks. Flight instructors are urged to include meaningful remarks and recommendations on the check ride form. This will aid in focusing future training.

4.19 Coordination and Scheduling

4.19.1 In addition to approving the use of MMA, the Assistant Administrator for the Office of Infrastructure and Administration and the Center Directors shall:

a. Ensure that the most cost-effective MMA is used to satisfy approved requirements. Exceptions to this usage shall be documented in writing. [246]

b. Coordinate trip itineraries and requirements with other NASA activities that could benefit from the use of available seats on each trip. [247]

4.20 Crew Complement

4.20.1 General. All personnel scheduled as primary flight crewmembers on NASA MMA passenger flights shall be trained and qualified in accordance with paragraphs 5.9 through 5.15 of this NPR. [248] Crew assignment, including identification of PIC, shall be designated in writing for each flight. [249]

4.20.2 Basic Crew. No aircraft carrying passengers shall be operated with less than the minimum basic crew specified below. [250] Exception: G-II/III aircraft may be operated with three pilots, one of whom functions as the Flight Maintenance Technician, or the flight may be operated without a flight maintenance technician at the direction of the Center Chief of Flight Operations.

a. Gulfstream II/III - PIC, SIC. Flight Maintenance Technician (optional)

b. King Air B200 - PIC and SIC

4.21 Crew Duty Time

4.21.1 Crew duty time is the total time a crew is on duty before the final termination of a flight. Crew duty time accrues consecutively and begins when a crew reports to a designated place of duty to start preparation for a flight and ends when the engines are cut at the end of the flight or series of flights. Using personnel as crewmembers who commenced other duties before reporting for a flight is not precluded; however, in this case, the crew duty time for the entire crew begins when those other duties commenced.

4.21.2 Duty Time Limitations. Basic crew duty time shall not be scheduled to exceed 14 consecutive hours except as set forth below. [251]

4.21.2.1 The Center Chief of Flight Operations may, for a particular flight, extend the basic crew duty time to 16 hours if the total time of crew duty is confined to the period between 4 a.m. and midnight (local time at departure point). The aircraft must be pressurized and have a functional autopilot.

4.21.2.2 Augmented crews will be used only as a last resort when all other options, such as rescheduling or pre-positioning other crews, are not possible. Consideration must be given to limiting passenger load to ensure that an adequate crew rest capability is available. Augmented crew duty time shall not be scheduled to exceed 18 consecutive hours. [252] The aircraft must be pressurized and have a functional autopilot. Flights requiring augmentation shall be approved by the Center Chief of Flight Operations and documented and maintained on file for a period of 12 months. [253]

4.21.2.3 Relief crews shall be pre-positioned if the mission schedule cannot be supported within the duty time limitations specified for a single or augmented crew. [254]

4.22 Crew Rest

4.22.1 Crew Rest Definition. Crew rest includes crew transportation prior to participating in flightcrew duties and will be provided prior to departure from the home station as well as at en route stops when mission schedule or crew duty limitations prevent the aircraft from returning to the home station.

4.22.2 Crew Rest Limitations

4.22.2.1 Crew rest shall normally provide at least 10 consecutive hours free of all official duties. [255]

4.22.2.2 At en route stops, crew rest shall not commence until one hour after termination of the mission in order to allow for necessary post-flight duties. [256]

4.22.2.3 The crew rest period shall end one hour prior to the crew beginning official duties in preparation for departure, normally at least one hour prior to scheduled takeoff time. [257]

4.22.2.4 The Center Chief of Flight Operations may approve a reduced crew rest of no less than 8 hours total ground time, provided this time is confined to between the hours of 8 p.m. and 8 a.m. local time. Approvals for reduced crew rest shall be limited to one occurrence per crewmember during any seven-day period. [258] Such approvals shall be documented and maintained on file for a period of 12 months. [259]

4.22.2.5 Time accrued by any flightcrew member traveling as a passenger on an aircraft may not be credited to meet any of the crew rest requirements of this chapter.

4.23 Maximum Flight Time Limitations

4.23.1 Flightcrew members shall not be scheduled, nor permitted, to function as members of MMA flightcrews, if their total professional flying time exceeds the following flight hours in table 4-3: [260]

Period	Flight Hours
7 consecutive days	35 hours
30 consecutive days	100 hours
90 consecutive days	300 hours
365 consecutive day	1,000 hours

Table 4-3 Maximum Flight Time Limitations

4.24 Hazardous Cargo

Hazardous material as defined in 49 C.F.R. 171.8 shall not be transported aboard NASA MMA. [261] Cargo to be shipped shall be routed through the Center's transportation office before acceptance or, if en route, cargo normally only shall be accepted from a certified shipper or freight forwarding agency. [262] Unaccompanied baggage will be treated as cargo.

4.25 Sterile Cockpit Procedures

During all critical flight operations, cockpit activities and conversation shall be limited to those involved with the direct operation of the aircraft. [263] This "Sterile Cockpit" environment must be maintained when below 10,000 feet above ground level (AGL) during approach and departure, except during prolonged cruise at an altitude below 10,000 feet AGL.

4.26 Crew Briefings

Before departure, the PIC shall brief the crew on all essential information concerning the

flight including weather, restrictions, and the duties and responsibilities of each flightcrew member. [264]

4.27 Flight Planning Considerations

4.27.1 Passenger Loading. Normally, all engines and propellers will be completely stopped when loading and unloading passengers or cargo from MMA. In those instances when, in the determination of the PIC, an extenuating circumstance requires loading or unloading passengers or cargo with an engine running, the following minimum precautions will be followed:

a. Only the engine on the opposite side of the aircraft from the loading door shall be operating and shall be operated at as low a power setting as practical.

b. A flightcrew member shall be positioned on the ground to ensure that passengers do not approach close to an operating engine or windmilling propeller. [265]

4.27.2 Passenger Briefings. The PIC shall ensure that all passengers have been briefed on the Disclosure for Persons Flying Aboard Federal Government Aircraft (see appendix B-2). [266] In addition, the briefing will include the no smoking policy, use of seat belts, location and operation of emergency and survival equipment, operation of doors and exits, and any other Federally required information. This information will be supplemented by printed passenger information cards. Prerecorded passenger briefings may be used, provided the sound reproduction is of high quality and provided a crewmember is present in the cabin during the briefing to answer passenger questions.

4.27.3 Flight Planning. Thorough flight planning is essential to the safe and efficient conduct of MMA passenger flights. A flight plan shall be filed for each flight. [267] Passenger flights shall be operated under instrument flight rules and, to the maximum extent possible, in controlled airspace; however, daylight flights of less than 100 nautical miles may be operated under visual flight rules if weather conditions permit. [268] These flights should utilize radar advisory service to the maximum extent possible.

4.27.4 Fuel Planning. Considering weather forecasts and any known en route delays, the minimum amount of useable fuel required at takeoff shall be sufficient to do the following:

a. Complete the flight to the destination airport.

b. Fly from that airport to the alternate airport, if required.

c. Fly after that for one additional hour using cruise fuel consumption at 10,000 feet mean sea level (MSL). [269]

4.27.5 Weather Planning. Prior to takeoff, the PIC shall receive a thorough weather briefing concerning current weather and forecasts for the proposed route, destination, and alternate destination. [270]

4.27.5.1 Departure Weather. Weather minimums for takeoff shall be not less than landing minimums unless a takeoff alternate is available. [271] A takeoff may be made when the weather is below landing minimums but not less than 1/8-mile visibility or Runway Visual

Range (RVR) of 800 feet and provided a suitable departure alternate is available within 30 minutes flight time with an engine inoperative. The weather reported at the departure alternate must be above landing minimums and forecast to remain so for at least two hours after takeoff per the following:

a. Precision Approach available: 200-foot ceiling and 1/2-statute mile (SM) visibility added to the published Precision Approach minimums.

b. Non-Precision Approach (only) available: 300-foot ceiling and 1-SM visibility added to the published Non-Precision Approach minimums.

4.27.5.2 En Route Weather. The PIC of an MMA flight will not file a flight plan requesting clearance into areas of reported or forecast severe icing conditions. Operative airborne radar is required for any flight into areas where current weather reports or forecasts indicate that thunderstorms may reasonably be expected and flight under daylight visual meteorological conditions is not possible. All flights shall be planned to circumnavigate areas of thunderstorm activity. [272]

4.27.5.3 Destination Weather. The PIC of an MMA flight may file for a destination that forecasts prevailing visibility equal to or greater than published landing minimums appropriate to the aircraft equipment, but not less than 1/2 mile or RVR 1,800 feet for time of arrival. If the destination weather is reported and forecast to be less than a 2,000-foot ceiling or less than three-mile visibility from one hour before until one hour after the estimated time of arrival (ETA), an alternate airport must be listed on the flight plan. Airport weather minimums shall meet or exceed the requirements of FAR part 91. [273]

4.27.5.4 New PIC. When the pilot has less than 100 hours PIC experience in the type (make and model) aircraft being operated, the minimum descent altitude (MDA) or the Decision Altitude (DA) and visibility landing minimums shall be increased by 200 feet and 1/2 mile (or the RVR equivalent) for all instrument approaches conducted by that pilot. [274] In no case shall the landing minimums be less than a 400-foot ceiling and one-mile visibility. [275] Similarly, takeoffs shall not be made if the airfield is below these adjusted landing minimums. [276]

4.27.6 Aircraft Logs. Prior to activating any aircraft system, aircraft maintenance forms shall be reviewed and evaluated. [277] Prior to flight, the PIC shall accept the aircraft by signing the form. DoD aircraft forms, Naval Aviation Logistics Command Management Information System (NALCOMIS), or equivalent forms may be used as a substitute for specific NASA forms. [278]

4.27.7 Weight and Balance Data. A copy of the current weight and balance data shall be carried aboard each MMA. [279] It is used to determine that the weight and center of gravity remain within limits for the duration of each flight.

4.28 Takeoff and Departure Procedures

4.28.1 Departure. On departure, navigational aids (NAVAIDS) shall be set up to aid in a possible expedited emergency return, as well as to aid in establishing the initial en route course. [280]

4.28.2 Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR). If installed and operative, the CVR and FDR shall be turned on during the entire flight. [281] Should an incident occur, the CVR and FDR power shall be removed and appropriate circuit breakers pulled following completion of the after-shutdown checklist. [282]

4.28.3 Enhanced Ground Proximity Warning System (EGPWS)/Terrain Awareness and Warning System (TAWS). EGPWS/TAWS shall be used on all flights. [283] If the equipment tests satisfactorily prior to takeoff, it must be assumed that any EGPWS/TAWS warning is valid unless the aircraft position can immediately and positively be verified by visual reference. Immediate and appropriate action shall be taken in response to all valid EGPWS/TAWS warning calls. [284]

4.28.4 Landing Lights. Landing lights shall be used during all takeoffs and landings and when operating near airports or in high-density traffic areas. [285]

4.28.5 Outside Vigilance. The PIC is responsible for ensuring that, during visual conditions, at least one person maintains a lookout for conflicting traffic at all times. Unnecessary paperwork will not be accomplished in the cockpit during aircraft climbs or descents.

4.28.6 Outside Observers. Use of any additional crewmembers to aid in outside vigilance is highly encouraged, particularly while operating in visual conditions in heavy traffic areas. Flight Maintenance Technicians shall remain at their duty station throughout the climb and descent. [286] Their cabin duties are considered secondary in importance during these times.

4.28.7 Traffic Alert and Collision Avoidance System (TCAS/TCAD) resolution advisories (RA) shall be followed. [287]

4.29 En Route Procedures

4.29.1 Passenger Considerations. The PIC is responsible for the safety and comfort of the passengers and must make every reasonable effort to keep the senior passenger or trip coordinator apprised of any significant deviations from the itinerary or schedule. In-flight delays and readily discernible abnormal conditions shall be explained to the passengers. [288]

4.29.1.1 Safety Belts. The PIC shall require that all passengers and crewmembers have safety belts securely fastened for taxiing, takeoffs, landings, and before entering an area of in-flight turbulence. [289]

4.29.1.2 Admission to the Flight Deck. Passengers shall not be admitted to the flight deck during "sterile cockpit" phases of flight. [290]

4.29.2 Minimum Fuel. The PIC shall notify ATC of the aircraft "minimum fuel" status at any time the fuel supply has reached a quantity where, upon reaching destination, little or no delay can be accepted. In no case may this quantity be less than that specified in table 4-6. [292] If fuel remaining indicates a need for traffic priority to ensure a safe landing, the PIC shall formally declare an emergency due to low fuel and shall report fuel remaining in minutes. [292]

4.29.3 Emergency Procedures. When an emergency or in-flight difficulty arises, the crew shall complete the checklists and report the nature and extent of the difficulty, intentions, and assistance required to the controlling ground agency. [293] In the event of an engine failure or shutdown, the aircraft shall land at the nearest suitable airport at which a safe landing can be made. [294]

4.30 Arrival, Approach, and Landing Procedures

4.30.1 General. During instrument arrivals, all available navigational aids shall be used. When available, precision approach guidance (Instrument Landing System or Precision Approach Radar) will be used for all night arrivals except for specific events during training flights. [295]

4.30.2 Weather Minimums. Pilots operating aircraft shall land the aircraft only when the flight visibility is equal to or greater than the visibility prescribed in the standard instrument approach procedure being used. [296]

4.30.3 Destination Below Minimums. If the destination weather is marginal or below minimums, the PIC may proceed to a suitable alternate or may hold if the destination weather is forecast to improve and fuel for alternate and reserve requirements will not be compromised. The weather at the alternate must be at or above alternate minimums and forecast to remain so until the new ETA plus one hour.

4.30.4 Approach Briefing. Before starting an approach, the pilot flying shall brief the crew on the procedures to be followed during the approach and landing and in the event of a missed approach. The briefing will include a review of the procedure to be flown, including key altitudes and restrictions, as well as specific crew duties during the approach and landing. [297]

4.30.5 Approach Progress. The following procedures will be followed during approach:

a. The pilot flying the approach shall announce his/her progress and intentions periodically. [298]

b. The pilot monitoring shall observe the approach and provide a continual cross-check of the navigational aids, instruments, air traffic control instructions, and approach procedures. [299]

c. Any deviations from the prescribed procedure shall immediately be brought to the attention of the pilot flying. [300]

d. The pilot monitoring shall call out "1,000 feet above" and "100 feet above" all key altitudes, as well as "minimums" upon reaching the Missed Approach position. [301]

e. When the runway is in sight, the pilot monitoring shall state, "runway in sight." [302]

f. If the runway is not in sight when the aircraft reaches the Missed Approach point, the pilot monitoring shall state, "go around." [303]

4.30.6 Use of Autopilot. Use of the autopilot during arrivals, descents, and approaches is

encouraged, particularly during visual flight conditions, as an aid in collision avoidance. To prevent excessive loss of altitude in the event of an autopilot failure, the pilot directing the aircraft shall maintain flight control contact throughout the final portion of an automatic coupler approach. Full manual control shall be assumed at or above published minimum altitude. [304]

4.30.7 Canceling Instrument Flight Plans. Normally, instrument flight plans will not be canceled prior to landing.

4.31 Post-flight Procedures

4.31.1 Closing Flight Plan. On completion of the flight, the PIC shall ensure the flight plan is closed with the appropriate facility. [305]

4.31.2 Aircraft Security. The PIC shall take prudent measures to secure and protect the aircraft at en route stops. [306] These measures should prevent unnecessary exposure to inclement weather, such as high winds and freezing precipitation, and also provide a reasonable degree of security from such activities as vandalism, theft, or terrorism. State Department Advisories and the DoD Foreign Clearance Guide (FCG) shall be consulted for out-of-continental United States (CONUS) operations. [307]

4.31.3 Aircraft Flight Logs. The flightcrew shall enter in the aircraft flight log each mechanical irregularity discovered during the flight. All unusual events (e.g., overweight or hard landings, lightning or bird strike, static discharge, or flight through hail or severe turbulence) will be recorded in the aircraft log. [308]

4.32 Specific Operational Restrictions

4.32.1 Use of Flight Manual Data. Aircraft flight manual data shall be used to ensure adequate takeoff, climb, approach, and landing performance is available for the actual conditions encountered. [309] Additional restrictions, as outlined in the tables below, are established to ensure a prudent level of safety during routine line operations.

4.32.2 Minimum Runway Lengths. Table 4-4 contains the minimum runway lengths to be used for the aircraft. Headquarters waiver is required for takeoffs from or landings on runways of lesser length runways. [310]

Aircraft	Runway
King Air B200	3,500 ft
Gulfstream II/III	6,000 ft

Table 4-4 Minimum Runway Length for MMA Operations

4.32.3 Wind Restrictions. For normal operations, airfields shall be considered below minimums for takeoff and landing when winds, including gusts, are greater than those established below: [311]

Aircraft	Maximum Component	Tailwind Component	Crosswind
King Air B200	45 kts	10 kts	25 kts
Gulfstream II/III	40 kts	10 kts	20 kts

Table 4-5 Wind Restrictions

4.32.4 Minimum Fuel for Landing. Minimum fuel for landing is established in recognition of three factors: (1) Fuel required to execute an unanticipated go-around and traffic pattern; (2) fuel required for landing and rollout; and (3) allowance for fuel quantity measuring system error. All flights shall be planned to have no less than the following minimum indicated fuel available at touchdown on the final landing: [312]

Aircraft	Minimum Landing Fuel
King Air B200	400 pounds
Gulfstream II/III	3,000 pounds

Table 4-6 Minimum Landing Fuel

Chapter 5. Unmanned Aerial Systems Operations

5.1 General

5.1.1 Emerging Concepts. Technological advances will continue to provide unprecedented leaps in UAS capability. NASA is primarily concerned with UAS technology as it applies to aeronautics, space science, and Earth science. Technology that permits the rapid dissemination of remote sensing data products will play an important role in this effort. Most importantly, the UASs must be responsive to the needs of the scientist and researchers by providing data-gathering capabilities through the use of modular payloads. Ideally, the UAS should be able to launch from the ground and provide consistent support to the researcher, while being able to return to land at a predesignated site. Future UASs must be very reliable with low mean time between failures and low maintenance man-hours per flight hour. The UAS must be maintainable in austere environments and require minimal manpower for servicing.

5.1.2 UAS Definition. A UAS is a powered aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, and can fly autonomously or be piloted remotely. UASs range from micro vehicles measuring inches in size and ounces in weight to large aircraft weighing more than 30,000 pounds. All UASs shall be operated to meet the requirements of this NPR. [313] Depending upon the UAS's capabilities, Center Directors and Chiefs of Flight Operations have the authority to determine the appropriate level of oversight. For example, small UASs that operate only within the radio control (RC) interface environment and below the FAA model aircraft-defined altitude of 400 feet require oversight and control that are particular to the Center from which they operate. Center guidance defines the appropriate level of control and oversight for each category of UAS.

5.1.3 UAS Flightcrew Definition and Responsibilities. The UAS flightcrews consist of UAS pilots, engineers, Principal Investigator and technicians, both civil service and contractor, who are required to operate a UAS and are authorized by position descriptions, letters of appointment, memorandums of understanding (MOU), memorandums of agreement (MOA), or contracts to perform UAS flight by the Center Director. Any UAS operated on behalf of NASA that operates within the National Airspace (NAS) shall be piloted by an individual who is either a NASA pilot or holds an FAA Pilot's License. [314] The UAS flightcrew is responsible for the safe control and operation of the UAS and must be involved in all mission planning, complete pre-launch, mission and recovery checklists, and assist in evaluating and disseminating in-flight data.

5.1.4 Policy. Center Directors shall establish procedures to ensure that all UAS flights are properly approved and documented. [315] Center Directors also shall ensure that UAS flightcrews and operations receive direct oversight by the Center Flight Operations Office or through another Center with a Flight Operations Department. [316] Because UASs are aircraft, other forms of control specific to aviation apply to their employment. The most common are air control, airspace control, and air direction, which are exercised by aviation personnel and agencies.

5.1.5 UAS Command and Control Systems. UAS flightcrews must have the capabilities to command, control, coordinate, and manage the UAS. These systems include air control and airspace control as discussed below:

5.1.5.1 Air Control. Air control is the authority to direct the physical maneuvers of a UAS in flight

or to direct a UAS to gather data or operate in a specific area.

5.1.5.2 Airspace Control. Airspace control provides for the coordination, integration, and regulation of the use of a defined airspace, and identification of all airspace users. Any airborne object that may interfere with the flight path or trajectory of any other object within the NAS airspace is of concern and requires airspace coordination and integration. Airspace control is the authority to direct the maneuvers of a UAS (along with other aircraft and airspace users) for the best use of the airspace. Airspace control is accomplished through established procedures for coordination of airspace by ATC or range authorities. Principles and procedures of airspace control used in manned flight operations apply to UAS operations. UASs capable of long-distance flight are normally routed through existing air control points by airspace control agencies. Airspace control authority is inherent in the operator whose unit is responsible for particular blocks of airspace; positive separation between aircraft and UASs is required and is the responsibility of the PIC and airspace control agency. This may be accomplished by the following:

a. Activating temporary airspace coordination areas (ACAs); Class D airspace or restricted operations zones (ROZs) for UAS takeoffs and landings; and mission areas or flight routes. ROZs are also known as restricted operations areas (ROAs).

b. Routing separation via existing air control points. Specific UAS routes may be created by connecting selected air control points.

c. Altitude separation, which can be effected by having block altitudes or by deconflicting whatever altitude at which the UAS is flying with other airspace users.

d. Time separation, which can be effected by having block times for UAS operations.

e. Any combination of the above, as required.

5.2 Planning

5.2.1 Operating Within the Continental United States. Before any deployment, considerable planning takes place well in advance of UAS operation. UASs increase the workload on personnel assigned, who very often know little about the unique requirements of UAS integration in operations in CONUS or overseas. Coordination with appropriate agencies or countries should occur as soon as the decision is made to employ a UAS.

5.2.1.1 Certificate of Authorization. The FAA is responsible for airspace management within the United States. If a UAS will be flown outside the boundaries of special use airspace, sufficient time must be allowed to authorize UAS operations. The regional FAA administrator will draft a certificate of authorization, which sets forth the requirements for UAS personnel qualifications, communications procedures, and a definition of the requested airspace. A UAS cannot fly beyond the boundaries of special use airspace without specific authorization of the FAA and the local air traffic control authority.

5.2.1.2 Memorandum of Understanding. A memorandum of understanding with the local air traffic control facility is required to ensure that they and the UAS flightcrews have a complete understanding and agree to the air traffic control procedures that will be used to ensure safe UAS operations in the operating area. If additional air traffic control services are required, the UAS operator may be asked to augment the local air traffic control facility with additional air traffic control personnel.

5.2.1.3 Letter of Agreement. A letter of agreement with local air facilities shall be completed to ensure that proper coordination of support requirements is understood and agreed to. [317] Fuel and

hazardous material storage, hangar facilities, runway use, or any other logistical and support requirements must be agreed on in this document.

5.2.2 Deployment Overseas. UASs are a relatively inexpensive information-gathering tool. Foreign governments are sensitive to the valuable information that could be collected by and capabilities of UASs, as well as to the inherent risks associated with unmanned flight operations. UAS planners must ensure UAS operations are included at the outset of integration planning within host nation (HN) airspace. Planners must have a firm understanding of the UAS to be employed so that they can definitely satisfy any protest or concerns from the HN. The UAS planner shall notify the U.S. Embassy or consulate in the HN of UAS operations within their represented country. [318] Waivers, agreements, and rules by the International Civil Aviation Organization, the HN's government and the U.S. Embassy must be thoroughly understood and signed before conducting UAS operations overseas.

5.3 Pre-Flight Operations

5.3.1 Operations Site. Particular consideration must be given to the location of the UAS operations site. Depending on the UAS, an adequate runway may be required for safe UAS operations. At a minimum, a proper landing surface must be available to safely recover the UAS upon completing its mission. Consideration also must be given to the distance from the UAS operations site to the area of operations (AO). Many UASs are not particularly fast and require considerable time to fly to their mission area. The location of an adequate launch and recovery area and its distance to the AO and control station are very important considerations when employing a UAS. Availability of adequate roads or other transportation methods for resupply of fuel and other UAS support requirements are critical to sustained UAS operations. If the UAS is expected to move from one site to another, transportation support becomes increasingly important.

5.3.2 Weather. UAS managers must consider the expected weather conditions in the AO at the time of operations. Many UASs cannot operate in inclement weather (e.g., high winds and precipitation or when the cloud layer is below the UAS's operating altitude). Due consideration must be given to probable weather conditions from the outset.

5.3.3 Communication. To provide UASs with adequate support, the command and control architecture must be linked to the UAS. Most UASs have a ground control station (GCS), a tracking and control unit, a portable control station (PCS), and remote receiving stations. The UAS is manually controlled by a pilot from a control station or is programmed to fly independently under control of its autopilot. More than one control station may be used to increase the UAS's effective range or to control more than one UAS.

5.3.4 Operational Phase. UAS operations are conducted similarly to manned aviation operations. Once the UAS has authority to conduct the mission, many tasks are executed simultaneously. The operations phase begins the planning process. The program managers and the UAS flightcrew study the assigned mission and plan for its operation. The maintenance crew begins preparation of the UAS and the UAS ground control system, while communications personnel ensure that the proper communication connectivity is provided to fulfill the mission.

5.3.5 Route Planning. UAS missions will be planned by the UAS planners in close coordination with the Flight Operations Office. This is done to ensure there is no conflict with other flight operations and to allow timely inclusion of UAS missions in the Center planning process. Flight planning for routes that afford little or no time to avert the response to an erroneous data entry that could lead to a significant mishap (Class C or higher) shall have independent review both before loading in the mission computer and after upload on the UAS is complete. [319]

5.3.6 In-flight Emergencies. During planning, sufficient attention must be given to the possibility that an in-flight emergency may occur. Particular attention should be given to the location of emergency landing sites if the UAS exits controlled flight and impacts the ground. Flight paths, minimum-risk routes, and other air management tools must be included.

5.3.6.1 Loss of Link Procedures. When a UAS senses a significant delay or loss of the command uplink, the predetermined loss of link procedures will be invoked to place the UAS on the return home profile. The UAS return home profile is a preapproved route at a preapproved altitude to its preapproved return home site. During this emergency, the UAS pilot will attempt to reestablish communication with the UAS.

5.3.6.2 Agency Notification. Upon notification of an in-flight emergency, emergency procedures shall be performed by the UAS pilot in accordance with the UAS operations manual. [320] The Flight Operations Office will then relay and coordinate with the appropriate agencies (e.g., FAA ATC). The Flight Operations Office will ensure that air control agencies have been notified of the UAS emergency and its expected course. Controlling agencies will ensure that other air assets are separated from the UAS's expected route of flight and notify the Flight Operations Office of any further actions taken.

5.4 Flight Operations

5.4.1 Flight Brief. A flight brief that includes the flightcrew, a program representative, and a maintenance representative shall be conducted prior to all flights. Briefs provide specific information in accordance with UAS SOPs. Briefs will include the following:

a. Weather update.

b. Program brief.

c. System update.

d. Emergency divert airfields

e. Emergency procedures and terminology

f. Mission profile. [321]

5.4.2 Takeoff Method. The maintenance crew readies the UAS for launch as the flightcrew performs systems checks to ensure systems perform in accordance with operating procedures. Systems checks shall include an independent means to verify waypoints entered into a navigational system prior to takeoff. [322]

5.4.2.1 If a suitable runway is available, the UAS operator may perform a conventional rolling takeoff. The length of runway required depends on the UAS. If a suitable runway is not available, then an alternate launch method must be used. An adequate surface area must be available for a safe landing for the UAS and clearance of nearby personnel.

5.4.3 Preparing for Recovery. Upon return to the UAS operations site, flight and maintenance crews prepare for UAS recovery. The UAS recovery checklist shall be adhered to in accordance with the operations manual. [323]

5.5 Pilot Requirements

5.5.1 Qualifications. UAS flightcrew members shall become qualified in accordance with written

standards set forth in Center-developed criteria. [324] Center Chiefs of Flight Operations, with the concurrence of the Center Director, shall designate a UAS pilot for a specific UAS aircraft type. [325] The Chief of Flight Operations shall ensure that each UAS flightcrew possesses an adequate level of training and experience to perform the duties of the designated positions. [326] Overall qualifications for the designations are made based on flightcrew overall flight experience, experience in similar types of UAS aircraft, experience in the actual UAS aircraft type, other training, and demonstrated performance. Designated UAS pilots are those who perform UAS piloting duties as a part of their official position descriptions, to fulfill NASA contract requirements, or in accordance with an interagency agreement.

5.5.2 Training. UAS pilots shall receive qualification training under direction of a military, civilian, or NASA UAS instructor pilot. [327]

5.5.2.1 Qualification training will vary with the UAS aircraft involved, but will normally include:

a. Ground training (including UAS ground control station checkout), handbook study, attendance at formal UAS aircraft training programs, emergency procedure training, and the performance of a UAS aircraft written examination (open book).

b. Simulator training, if available, including normal and emergency procedure training.

c. UAS aircraft checkout flights including a prescribed number of UAS flights and landings (if applicable) under the supervision of a UAS instructor pilot.

d. A mission profile flight monitored by a UAS instructor pilot to obtain full UAS mission qualification.

5.5.2.2 An initial UAS checkout training program shall be developed by each Center and documented in the UAS flightcrew flight record file with the approval of the Chief, Flight Operations Branch. [328] The checkout training program will be tailored to consider previous experience in UAS aircraft, currency in similar types of UAS aircraft, previous training background, and availability of other resources to ensure an adequate level of training.

5.5.2.3 In the case of prototype, experimental, or research UAS aircraft for which no formal schools are available, the services of the designers and the manufacturer's best qualified personnel shall be utilized to brief and familiarize the UAS pilots with the aircraft, UAS aircraft systems, and ground control stations. In addition, existing UAS simulators and UAS aircraft of a similar nature will be used to train pilots prior to flying a UAS research vehicle. [329]

5.5.2.4 Training for all members of the UAS flightcrew shall include crew resource management training. [330]

5.5.3 Currency. Center Directors have the authority to establish and approve UAS flight currency requirements for all flightcrews operating assigned UAS aircraft. This includes specific requirements established for particular UAS flight research programs and UAS aircraft. Records of qualification and flight evaluation are required. A review of UAS pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met. [331] The Center Chief of Flight Operations shall designate the crewmembers for UASs that are under the Center's purview. [332]

5.6 Airworthiness and Flight Safety Reviews

5.6.1 General. The airworthiness requirements detailed in chapter 2 must be used for UAS airworthiness approvals. Additionally, all UAS flight operations under NASA purview are subject to

the requirements of NPR 8715.5, Range Safety Program.

5.6.2 Airworthiness and Flight Safety Review Board. The Airworthiness and Flight Safety Review Board (AFSRB) shall participate in or, at their option, conduct reviews to establish the airworthiness and evaluate the safety of flight operations. [333] The chair and members are designated by the Center Director. Other personnel who must participate in the review include the Safety, Reliability, and Quality Assurance Office, the mission manager and/or Principal Investigator, the UAS operator, Range Safety personnel, and the cognizant UAS Contracting Officer Technical Representative (COTR) manager.

5.6.2.1 The following topics shall be addressed by a NASA AFSRB to assess the risks associated with a UAS flight program:

a. General outline of major UASs.

b. Communication links and frequency management plan.

c. Flight control system and configuration control procedures.

d. Backup systems and procedures.

e. Flight terminations systems including ground abort. [334]

5.6.3 Public Safety. The program/project manager shall limit the assessed collective risk associated with aerospace vehicle operation and ensure that the probability of doing harm to a member of the general public is not greater than the criteria established by NPR 8715.5, Range Safety Program. [335] The ability to achieve this level of protection can be demonstrated through a combination of analysis, test, simulation, use of redundancy in design, and flight operational

procedures.

Chapter 6. Aviation Safety

6.1 Introduction

6.1.1 This chapter describes the roles and responsibilities of NASA Aviation Management and Aviation Safety Professionals and defines minimum qualifications and training of Center ASOs. The chapter also provides the basic requirements for the NASA Aviation Safety Program and provides structure for managers and ASOs to establish/implement their local programs. Managers and ASOs will also find requirements regarding aircraft hazard and mishap reporting.

6.1.2 The objectives of the NASA Aviation Safety Program are accomplished through the detection and elimination of hazards, safety awareness training, and enforcement of high standards of conduct and performance. The primary purposes of the NASA Aviation Safety Program are:

a. Preserving human and material resources by preventing damage and injury through the elimination of aviation safety hazards throughout NASA.

b. Enhancing safety awareness in all NASA employees and contractor personnel.

6.2 Aviation Safety Roles and Responsibilities

6.2.1 Chief, Safety and Mission Assurance provides leadership, policy direction, functional oversight, assessment, standards, and coordination for safety and mission assurance affecting NASA aviation operations.

6.2.2 Center Directors are responsible for the safe operation of all aircraft, including UASs, assigned to or operating from their Centers. Center Directors will support and maintain an aviation safety program and organization in accordance with this chapter. Center Directors shall ensure that the Center ASO is granted formal access to senior management when safety issues cannot be resolved at a lower level in the flight organization. [336]

6.2.3 The Center Chief of Flight Operations is the senior line manager with authority and responsibility for all flight operations at the Center and is responsible to the Center Director for the safe and effective operation of all aircraft, including UASs. This is necessary to ensure that aviation management decisions are made only by designated and qualified individuals and to ensure that management actions do not create or contribute to unsafe conditions.

6.2.4 The Director, HQ AMD is responsible for the implementation of Agency aviation safety policy developed by the Office of Safety and Mission Assurance. The Director, HQ AMD, will ensure that adequate reviews of all NASA flight operations are conducted to ensure that NASA aircraft management policies are followed.

6.2.5 The Headquarters Aviation Safety Manager (ASM) within the Office of Safety and Mission Assurance (OSMA) shall be a qualified ASO. [337] The ASM shall provide safety and mission assurance oversight for Agency aviation activities. [338] Additionally, the ASM shall:

a. Coordinate with AMD regarding OSMA requirements affecting aviation safety or reporting. [339]

b. Identify aviation safety issues through mishap investigation and analysis. [340]

c. Participate in the annual NASA ASO conference. [341]

d. Monitor the implementation of the Agency's Aviation Safety Program. [342]

e. Attend selected program flight readiness and safety reviews. [343]

f. Serve as an advisor to the IAOP and participate in IAOP activities, including meetings, reviews, and subpanel activities. [344]

g. Conduct aviation safety staff assistance visits and reviews. [345]

h. Coordinate recommendations from mishap investigations that require corrective action from sources or agencies outside of NASA. [346]

i. Participate in selected aircraft flight operations. [347]

6.2.6 The HQ AMD ASO serves as the senior advisor to the Assistant Administrator for Infrastructure and Administration and the Director of the AMD on aviation safety matters. The ASO is responsible for implementing the Agency's Aviation Safety Program, coordinating the NASA Annual ASO Conference, and managing the Agency's IAOP Review Program. The ASO also provides aviation safety support to Center aircraft managers and ASOs, and serves as liaison to other Federal agencies and military services on aviation safety matters.

6.2.7 The IAOP ASO subpanel keeps the IAOP chairman informed of safety developments and issues. The ASO subpanel chair serves as the main interface between Center ASOs and Headquarters, providing advice and counsel regarding safety issues and concerns. The ASO subpanel chair is responsible for briefing safety issues and concerns of the Centers to the IAOP panel, and shall schedule and conduct subpanel meetings and teleconferences. [348] The chair is selected from the membership of the ASO subpanel.

6.2.8 Center Aviation Safety Officers. The Center Chief of Flight Operations, with the concurrence of the Center Director, shall appoint an ASO. [349] The ASO will be a civil servant assigned to the Flight Operations Department, serve as the Center's focal point for aviation safety and act on behalf of the Center Director when discharging this responsibility. The ASO has the duty to advise the Chief of Flight Operations regarding safety issues/concerns within the organization. Managers will use the advice of the ASO in formulating organizational decisions but must not expect or rely upon the ASO to make managerial decisions. The ASO serves as a member of the Center's ARB and is responsible for managing the Center's aviation safety program and ensuring that the goals of the program are clearly understood. If the ASO believes that a safety concern has not been dealt with sufficiently by the Flight Operations organization, the ASO may take the concern directly to the Center Director. In addition, the ASO may take the concern to Chief, Safety and Mission Assurance or the Assistant Administrator for Infrastructure and Administration.

6.2.9 Aviation Safety Officer qualifications include the following:

6.2.9.1 The ASO shall hold qualification as a NASA PIC in type. [350]

6.2.9.2 The ASO, within one year of appointment, shall complete a two-week course in aviation safety program management. [351] Within two years of appointment, the ASO shall have graduated from a recognized Military Aviation/Flight Safety Officer Course or an Academic Aviation Safety Certificate Program (of at least six weeks' duration). [352]

6.2.10 Aviation Safety Officer Recurrent Training requirements include the following:

6.2.10.1 Recurrent Training. Each Center shall establish a continuing education program to ensure that each ASO maintains adequate knowledge to discharge the duties of the office. [353] To maintain familiarity with the latest aviation safety principles as a NASA ASO, the ASO shall be actively engaged in the Center's aviation operations program and complete 40 hours of continuing education in ASO course elements within 24 calendar months. [354] Training for ASOs may include

any of the following course elements:

a. Aviation safety program management.

b. System safety.

c. Aviation accident investigation.

d. Mishap planning.

e. Human factors.

f. Maintenance safety.

g. Risk management.

h. Aviation law.

i. Crew resource management.

j. Occupation Safety and Health Administration (OSHA).

k. Aviation medicine/physiology.

6.3 Center Aviation Safety Program

6.3.1 The Center Aviation Safety Program shall be documented in a single comprehensive manual. [355] The program must address requirements of the aviation ground environment, as well as all aspects of the flight environment. NASA Aviation Safety Programs are dynamic and must provide oversight to the many changes that occur in the aviation operational environment. The following program elements are required by NASA policy or Federal regulation:

6.3.1.1 Center Aviation Safety Working Group. The Center aviation safety working group provides a forum to discuss and resolve Center aviation safety issues. The working group is chaired by the ASO, shall meet at least semiannually, and reports to the Chief of Flight Operations. [356] Areas represented on the working group include but are not limited to: operations, maintenance, engineering, aviation safety, airfield facilities, and quality assurance.

6.3.1.2 Inspections and Evaluations. Headquarters AMD, together with independent oversight from the Office of Safety and Mission Assurance, shall conduct an aviation safety review of each Center biennially utilizing the IAOP Review Program. [357] Centers conducting flight operations shall perform an independent flight operations review during the alternate year when an IAOP review is not scheduled. [358] This review may be conducted by the Center Safety Office or an external aviation inspection organization and must provide an objective evaluation of selected aircraft operations, maintenance, crew procedures, and facilities to ensure safe and efficient operation.

6.3.1.3 Close Call Reporting (Hazards and Anomalies). The Center aviation safety program shall establish a procedure for collecting hazards/anomalies/Close Calls data from personnel. [359] This procedure must document and direct hazards to the appropriate management level for investigation and resolution. Close Calls must be documented, trended, and disseminated to internal personnel and other NASA flight organizations for educational and awareness purposes. Centers shall follow the Close Call reporting requirements contained in NPR 8621.1. [360]

a. A Close Call is defined as an occurrence or a condition of employee concern in which there is no injury or only minor injury requiring first aid and no significant equipment/property damage/mission failure (less than $1,000), but which possesses a potential to cause a mishap.

b. A hazard is defined as an existing or potential condition that can result in or contribute to a mishap.

c. Aircraft Mishap and Close Call Investigation. The principles of mishap reporting, investigation, identification of root causes, and corrective action are central to an effective aviation safety program, which will be conducted in accordance with NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping. Close Call reporting, investigation, and dissemination of lessons learned are essential elements of mishap prevention.

6.3.1.4 Cultural Surveys. The Chief of Flight Operations with the assistance of the ASO shall conduct a Government/industry-recognized cultural survey, assessment, or workshop within aircraft operations every two years or within six months of hiring a new Chief of Aircraft Operations. [361] This survey must:

a. Determine employees' expectations of the Center's aviation safety program, and

b. Evaluate the effectiveness of the current aviation safety program. The goal of this survey is to provide anonymous feedback to management regarding perceptions of organizational climate, management practices, safety, and risk mitigation. These surveys will foster better communication by highlighting and addressing concerns within flight operations.

6.3.1.5 Quarterly Aviation Safety Training. ASOs shall conduct safety training for operations and maintenance personnel. [362] The ASO shall establish a process to ensure that topics covered are disseminated to those who could not attend. [363]

6.3.1.6 Awards Program. Centers shall establish an Aviation Safety Award program. [364]

6.3.1.7 Risk Assessment and Hazard Analysis. The ASO shall ensure that risk assessment and hazard analysis procedures are established. These procedures must address risks, hazards, and mitigation methods associated with aircraft modifications and research flights in accordance with chapter 2 of NPR 8715.3, NASA General Safety Program Requirements. [365]

6.3.1.8 Project and Program Safety Plans. The ASO shall ensure that project and program safety plans are subject to a review process. [366] The review ensures that the plans address associated risks and hazards with the specific project or program. Once approved, the ASO shall ensure the plans are disseminated to all involved personnel. [367] The requirement for these safety plans may be satisfied by flight test plans or safety permits but still are subject to the review process.

6.3.1.9 Facilities and Equipment. The ASO shall ensure that aviation facilities are maintained and inspected in accordance with applicable OSHA and NASA safety standards. [368] These facilities include, but are not limited to, the airfield, aircrew spaces, maintenance shops, ground support equipment, Crash Fire Rescue (CFR) facilities, and ATC facilities.

6.3.1.10 Cargo Safety. The ASO shall provide safety oversight during the handling and stowage of cargo, including hazardous materials, aboard NASA aircraft. [369] While the Transportation Officer ensures that mixed cargo and passenger loads meet all Federal requirements, the ASO ensures that contract carriers and airlift services used by NASA comply with Department of Transportation (DOT) regulations, including 49 C.F.R. 175, Carriage by Aircraft, in the transportation of hazardous materials and cargo.

6.3.1.11 Dissemination of Aviation Safety-Related Information. ASOs shall ensure that aviation safety-related information is distributed throughout aircraft operations and maintenance. [370] Safety information that would be of interest Agency-wide shall be sent to the Office of Safety and Mission Assurance for distribution. [371]

6.3.1.12 Crew Resource Management and Training. All NASA aircrew shall, at least once per calendar year, attend a crew resource management course of at least four hours in duration. [372]

6.4 Pre-Mishap Plan/Aircraft Incident Response Plan

6.4.1 Each Center shall publish and maintain an Aircraft/Airfield Pre-Mishap Plan in accordance with the procedures established in NPR 8621.1. [373] Proper response to an aircraft mishap requires documented preplanning to mitigate risk to personnel and property. The pre-mishap plan must be tailored to local needs and capabilities, and be developed and coordinated with all supporting and supported activities or agencies. The plan must clearly assign responsibilities, provide for alternative plans, ensure optimum use of available and backup resources, and be rehearsed annually. This exercise may be accomplished through desktop or simulation, as appropriate. The plan shall be maintained for each NASA operational airfield, heliport, and aviation activity. [374] In addition to the requirements delineated in NPR 8621.1, each Center plan shall:

a. Ensure local fire/crash-rescue personnel are briefed annually on rescue and emergency procedures peculiar to the aircraft regularly operated at that facility and prior to operation of newly acquired aircraft. [375]

b. Ensure that mock mishap drills are held and that the ASO evaluates the results to ensure optimal coordination with pre-mishap plans. [376]

c. Address procedures for aircraft mishaps away from home field. [377]

d. Establish procedures for notifying and working with the National Transportation Safety Board (NTSB) and the FAA for aircraft accidents reportable under Federal regulations. [378]

Chapter 7. Aviation Medical Program

7.1 Introduction

7.1.1 This section details requirements and procedures for medical certification of NASA aircraft primary crewmembers. It is applicable to NASA Headquarters and Centers, including Component Facilities, and applies to both civil service and contractor pilots flying NASA aircraft. This section does not apply to space flight or to astronaut pilots.

7.2 Primary Aircrew Medical Requirements

7.2.1 Pilots. Pilots shall hold an FAA First Class medical certificate, military pilot flight physical, or NASA flight medical certification renewed annually or more frequently if specified by the Center Director or a competent medical authority. [379] At the discretion of the Center Chief of Flight Operations, records of aeromedical certification conducted by non-NASA Aviation Medical Examiners (AMEs) may be reviewed by a NASA Aeromedical Physician.

7.2.1.1 Flightcrew of high performance jet aircraft or ejection seat configured aircraft shall obtain a military pilot flight physical or NASA flight medical certification. [380]

7.2.1.2 Pilots 55 years of age and older shall be medically certified every six months. [381]

7.2.2 Flight Engineers. Flight Engineers shall hold either an FAA Second Class medical certificate, military flight physical, or NASA flight medical certification, which must be renewed annually or earlier if specified by a competent medical authority. [382].

7.2.3 Other Primary Aircrew. Other primary aircrew shall hold either an FAA Third Class medical certificate, military flight physical, or NASA flight medical certification, which must be renewed annually or earlier if specified by a competent medical authority. [383].

7.2.4 Qualified Non-Crewmembers. Qualified non-crewmembers shall obtain medical clearances as required by Center procedures. At a minimum, a medical screening must be conducted by a NASA physician as appropriate for the mission. [384]

7.2.5 Primary Aircrews Released From Flight Status due to Medical Disqualification. Center Directors shall establish procedures, in coordination with their personnel offices, to ensure that primary aircrews are assigned to duties not involving flying if they become medically disqualified. [385]

7.3 Flight Physical Records

7.3.1 Copies of current medical certification shall be kept on file at the primary aircrew and qualified non-crewmembers' operating site. [386]

7.3.2 Upon completion of a flight physical, the individual will notify the Chief of Flight Operations of the pass/fail status. The Chief of Flight Operations may request certificate confirmation from the awarding authority.

7.3.3 Centers may choose to accept flight physicals conducted by non-NASA Aviation Medical Examiners (e.g., an FAA-AME). At the discretion of the Chief of Flight Operations, a review of the

records of aeromedical certification by a NASA Aeromedical Physician can be requested.

7.4 Review Boards

7.4.1 NASA Aerospace Medicine Board. When requested by the Center or individual, the medical examination results of pilots who do not meet the required standards may be reviewed by the NASA Aerospace Medicine Board and NASA Medical Policy Board in accordance with NPD 1000.3, The NASA Organization.

7.5 Waivers

7.5.1 Flightcrews shall report Special Issuances (FAA Waivers) and FAA Statements of Demonstrated Ability (SODA) to the Chief of Flight Operations for review by a NASA Aeromedical Physician. [387]

7.5.2 Considerations for NASA-specific aeromedical waivers will be processed through the NASA Aerospace Medicine Board and the NASA Medical Policy Board as appropriate.

Chapter 8. Aircraft Acquisitions and Dispositions

8.1 General

This chapter establishes policy for acquisition and disposition of all NASA aircraft/UASs. Center Aircraft Flight Operations organizations shall coordinate all aircraft acquisition and disposition actions with the cognizant Center Supply and Equipment Management Officer(s) in accordance with NPR 4200.1, NASA Equipment Management Procedural Requirements. [388] In addition, transfer of aircraft between Federal agencies and disposal of aircraft, including exchange/sales by Federal agencies, must be authorized by GSA.

8.2 Aircraft Acquisition

Prior to acquiring aircraft for operational use, the Associate Administrator of the Mission Directorate or the Center Director shall submit an acquisition request to the HQ AMD per appendix G, along with a business case analysis in support of the aircraft acquisition. [389] The business case analysis may be in a format of choice, but must contain sufficient detail to answer questions posed in OMB Circular A-11, Exhibit 300, Part I. The purpose of the business case analysis is to determine the most economical acquisition alternative, over the life cycle of the program, in meeting stated aircraft requirements. The business case analysis also must clearly link the aircraft acquisition to Agency strategic objectives and specific program/project goals and identify life cycle budget requirements. Typical acquisition alternatives include use of existing Agency aircraft, use of other agencies' aircraft, aircraft lease, aircraft rental, turn-key aircraft services, and procurement. Procurement of aircraft shall be conducted in accordance with established Federal Acquisition Regulations and guidelines, including OMB Circulars A-76 and A-126, and initiated only after approval from the Assistant Administrator for Infrastructure and Administration and after the following alternatives have been considered in the following order:

a. Use of available NASA aircraft resources.

b. Use of public aircraft owned by other Government agencies through loan or transfer.

c. Charter or lease of civil aircraft.

8.2.1.1 In completing appendix G, the program/project manager must coordinate with the Center Environmental Management Office to determine whether the proposed aircraft acquisition requires preparation of an environmental assessment. [390]

8.2.2 The Assistant Administrator for Infrastructure and Administration reviews and approves aircraft acquisition requests, including long-term aircraft leases, after coordination and consultation with appropriate the Mission Directorate Associate Administrator, the Office of the General Counsel, the Office of the Chief Financial Officer (CFO)/ Comptroller, the Office of Legislative and Intergovernmental Affairs, and the Office of External Relations (if DoD related).

8.2.3 Mission Directorates establish the requirements and funding level for each aircraft assigned to support their programs and must approve the program/project managers' acquisition requests prior to submission to the HQ AMD.

8.2.4 The HQ AMD coordinates and assists Mission Directorates, program/project managers, and

Centers with acquisition, assignment, and disposition of all aircraft. AMD shall enter all acquired aircraft into FAIRS. [391]

8.2.5 Centers shall record all acquired aircraft in the NASA Equipment Management System (NEMS) in accordance with NPR 4200.1, NASA Equipment Management Procedural Requirements. [392] Centers shall register all aircraft, excluding parts and DoD-loaned aircraft, with the FAA. [393]

8.3 Aircraft Materiel Acquisition Procedures

8.3.1 "Parts Aircraft" Acquisition. The program/project manager or Center Director shall notify the HQ AMD prior to acquisition of an aircraft whose intended use is solely for "parts aircraft." [394] In addition to all applicable Federal regulations, acquisition of aircraft whose intended use is solely for "parts aircraft" are subject to the following procedures:

8.3.1.1 Centers shall remove the data plates from all aircraft acquired solely for parts purposes and forward the data plates to HQ AMD for disposition. [395]

8.3.1.2 Centers shall enter parts aircraft into each respective Center's property inventory records in accordance with NPR 4200.1, NASA Equipment Management Procedural Requirements. [396]

8.3.2 Aircraft Materiel Acquisition. Aircraft materiel, such as spare parts, shall be acquired, managed, and controlled in compliance with NPR 4100.1, NASA Materials Inventory Management Manual. [397]

8.4 Aircraft Disposition

8.4.1 NASA aircraft are usually unique, highly modified aircraft used to meet a requirement or capability not readily available in the marketplace. A NASA owned aircraft must be disposed of when it is excess to the current and anticipated needs of the Agency. Disposal of NASA owned aircraft shall be in accordance with Federal Property Management Regulations and the applicable portions of NPD 4300.1, NASA Personal Property Disposal Policy, and NPR 4300.1, NASA Personal Property Disposal Procedural Requirements. [398] Disposal of NASA aircraft identified as artifacts or heritage assets shall be in accordance with NPR 4310.1, Identification and Disposition of NASA Artifacts. [399] Aircraft disposition shall be coordinated in advance with the HQ AMD and approved by the Assistant Administrator for Infrastructure and Administration. [400]

8.4.2 Aircraft With an FAA Certificate of Airworthiness. When an aircraft that has an FAA Certificate of Airworthiness is removed from the inventory, the Certificate shall be removed from the aircraft and forwarded to the HQ AMD for disposition unless the aircraft is transferred to another Government agency that intends to operate it or it is sold through GSA to a civil operator. [401]

8.4.3 Aircraft Without an FAA Certificate of Airworthiness. When an aircraft is removed from the inventory that is not capable of obtaining an FAA Certificate of Airworthiness or is deemed by the Center Flight Operations Office to be unsafe for civil use, the manufacturer's data plate shall be removed and forwarded to the HQ AMD for disposition. [402] Every effort will be made, including destruction of the aircraft, to ensure that aircraft parts which are not FAA certified are kept out of circulation.

8.5 Aircraft Inventory

8.5.1 In accordance with Chapter 2 of NPR 4200.1, NASA Equipment Management Procedural Requirements, Centers shall conduct annual physical inventories of Center-owned aircraft, including display aircraft, parts aircraft, and aircraft in flyable or non-flyable storage, to determine the accuracy of the records and the NEMS control system. [403] Adjustments will be made to ensure that financial statements are accurate.

Chapter 9. Inter-Center Aircraft Operations Review Program

9.1 Purpose

9.1.1 The NASA Inter-Center Aircraft Operations review program provides peer review and an objective management evaluation of the procedures and practices that are being used at the operating Centers to ensure safe and efficient accomplishment of assigned missions and goals. In addition to providing Center Directors and HQ management officials with an overview of the general health of all aspects of Flight Operations, the review teams also identify deficiencies in, or deviations from, NASA wide policies, procedures, and guidelines. Results of the reviews shall be used to update NASA-wide or local requirements in order to enhance standardization and improve productivity. [404] The evaluations are conducted primarily by Inter-Center team members and, thus, are a valuable method of communicating current information among Center Flight Operations personnel (See appendix C for an example review plan and appendix D for the review sheet.)

9.2 Responsibilities

9.2.1 It is important that the Inter-Center Aircraft Operations Panel support the review program. The HQ AMD shall establish inter-Center review teams to review all aspects of flight operations at NASA Centers, including the implementation of Center procedures, either biennially or as determined by the HQ AMD. [405] The Centers and appropriate HQ offices (e.g., AMD, Aviation Safety) will provide personnel to serve on the teams. The HQ AMD will coordinate the review program.

9.3 Procedures

9.3.1 In conducting reviews, including special or directed reviews, the following guidelines will be used:

9.3.1.1 A review team will include a team leader who is a member of the IAOP and either a Center Flight Operations chief or deputy. Seven to twelve team members selected from various Centers and HQ provide expertise in the areas of operations, maintenance, quality assurance, avionics, and aviation safety. The mix of members will vary for each review. The HQ AMD will provide a member for each review who is responsible for analyzing management practices and special interest items. In addition, the Office of Safety and Mission Assurance will provide a member for each review who is responsible for aviation safety compliance. The HQ AMD will maintain a current review schedule.

9.3.1.2 HQ AMD will write a letter to the appropriate Center Director listing the scope and time of the review and requesting a briefing on the Center's Flight Operations program.

9.3.1.3 Depending on the level of flight activity at a Center, the reviews should be completed within a period of three to five days. The team leader will ensure that sufficient time is spent at the site for a thorough review. All reviews will begin with a team entrance briefing and conclude with an exit debriefing between the review team and the Center Director or his/her deputy. At the entrance briefing, the team leader will introduce the team members and explain the scope and purpose of the review.

9.3.1.4 The entrance briefing given by the Center to the review team shall be comprehensive. Local operations and maintenance documents will be made available to the team, and the team members will familiarize themselves with the documents before performing field work. [406]

9.3.2 Instructions for reviewers shall ensure compliance with established standards, including FAA, DoD, manufacturer, industry, and association standards. [407]

9.3.3 The HQ AMD will maintain updated IAOP review checklists. Review checklists will be made available to each review team member to use as a guideline to ensure compliance with applicable instructions. Team members will discuss findings and recommendations with the affected Center party to ensure mutual understanding of the observations. Minor discrepancy items will be brought to the attention of the first-line supervisor for immediate corrective action. The team leader shall hold daily team progress meetings to discuss discrepancies and recommendations. [408]

9.3.4 The team leader's exit briefing shall be in sufficient detail to inform Center management of the status of local Flight Operations activities with particular emphasis on significant findings and recommendations requiring management attention. [409]

9.3.5 The review team shall document results in a brief report that focuses on significant findings and recommendations. [410] The review report will address those items that require senior management attention and also identify those activities that are being performed in an outstanding manner. Criticality criteria will be used to assist management in prioritizing responses as follows: Required Action, Recommendation, and Commendable Finding. Required Actions must cite the specific requirement that is not being met. The report shall be forwarded by the review team leader to the Assistant Administrator for Infrastructure and Administration with a copy to the Center Director. [411]

9.3.6 The Center Director shall respond to the Assistant Administrator for Infrastructure and Administration concerning corrective actions. [412] The HQ AMD will review the response for adequacy, follow up as necessary, track recommendation responses, and close out the report.

Chapter 10. NASA Inter-Center Aircraft Operations Panel

10.1 Purpose

10.1.1 NPR 1000 establishes the IAOP and sets forth its functions, membership, meetings, duration, assessment, and records retention.

10.1.2 The IAOP is established to provide advice, counsel, and recommendations for consideration by the Administrator and/or the NASA Operations Management Council to assist NASA senior management in all aspects of aircraft operations. Additionally, it monitors and reviews NASA aviation activities, emphasizing the efficient use of related resources and operational aviation safety.

10.2 Authority

10.2.1 Authority. The following references establish the authority for the IAOP.

a. 42 U.S.C. 2473 (c)(1), Section 203 (c)(1) of the National Aeronautics and Space Act of 1958, as amended.

b. NPD 7900.4, NASA Aircraft Operations Management. 10.2.2 HQ AMD is responsible for delineating the function and purpose of the IAOP.

10.3 Functions

The NASA IAOP will accomplish the following:

10.3.1 Advice and Recommendations. Provide advice and recommendations to the Assistant Administrator for Infrastructure and Administration and other NASA Senior Management officials concerning Agency policies and other matters related to NASA aircraft.

10.3.2 Conduct Semiannual Meetings. Conduct semiannual meetings to review status, to discuss issues, and to advise the HQ AMD and the Assistant Administrator for Infrastructure and Administration concerning uniform policies and procedures related to the following matters:

a. Aircraft operations, guidelines, and requirements.

b. Flightcrew standards, training, and proficiency.

c. Aviation safety.

d. Aviation medical requirements.

e. Airworthiness, maintenance, and quality assurance.

f. Aircraft flight readiness reviews/hazard analysis.

g. Facilities requirements.

h. Resources requirements, utilization, and planning.

i. Aircraft acquisitions, dispositions, and categorization criteria.

j. Passenger operations/additional crewmembers.

k. Uniform reporting system.

l. UASs.

10.3.3 Review and recommend procedures and methods for effective inter-Center aircraft operations, including the following:

a. Interchange of pilots and flight activities of mutual interest between or among Centers.

b. Providing information, as required, to NASA Management about active and planned aircraft program activities, including briefings of the various missions and modes of operations existing at the Centers.

10.3.4 Participate in and monitor functional reviews of aircraft operations biennially at each Center with aircraft. The review teams shall, for Center review purposes, function independently of Center management. [413]

10.3.5 Conduct reviews of a special nature at the request of the Assistant Administrator for Infrastructure and Administration.

10.3.6 Coordinate findings dealing with institutional management issues with the Deputy Associate Administrator prior to publication.

10.4 Membership

10.4.1 The Panel is composed of NASA Aircraft Operations representatives from each Center. The Panel may invite advisors and other personnel, as necessary, to accomplish its review and oversight function. The chairperson will be designated by the Assistant Administrator for Infrastructure and Administration for a term of three years. Membership is as follows:

10.4.2 The voting membership of the Panel is the Flight Operations Chiefs of NASA Centers.

10.4.3 Permanent Advisors include the following:

a. Center Aircraft Procurement Representative--for Centers without an active Flight Operations Office.

b. HQ Office of Safety and Mission Assurance, ASM.

c. HQ Chief Health and Medical Officer.

d. HQ Office of the General Counsel.

e. HQ Office of the Chief Financial Officer.

f. HQ AMD, Director.

g. HQ AMD, ASO.

h. HQ Staff, AMD (Executive Secretary).

i. NASA Engineering Safety Center (NESC) Aircraft Aviation Safety Representative.

10.4.4 Mission Directorate Advisors

a. HQ Space Operations.

b. HQ Aeronautics Research.

c. HQ Science.

d. HQ Exploration Systems.

10.4.5 The IAOP includes two standing subpanels:

a. Maintenance Subpanel comprising the Maintenance Chiefs from each Center operating aircraft.

b. Aviation Safety Subpanel comprising ASOs (or designated safety representative) from each Center operating or procuring aircraft or aircraft services. Each subpanel reports directly to the IAOP chair.

10.4.6 Ad hoc subpanels may be formed and called to order at any time to address a specific topic and will be in existence until cancelled by the IAOP chair.

10.4.7 The Administrator may change the membership or designate temporary members at any time. Such changes will become effective immediately and be reflected in subsequent revisions of NPR 1000.

10.5 Meetings

The IAOP will meet semiannually.

10.6 Duration

The IAOP will continue until this directive is canceled or amended to disestablish the IAOP.

10.7 Assessment

10.7.1 The IAOP will submit written reports to the Assistant Administrator for Infrastructure and Administration detailing the results of each regular or special IAOP review of a Center within 60 days of such reviews and provide minutes that detail accomplishments and/or recommendations resulting from each semiannual IAOP meeting within 60 days of those meetings.

10.7.2 The HQ AMD will summarize the accomplishments of the IAOP and provide an annual report of those accomplishments to the Assistant Administrator for Infrastructure and Administration for assessment of performance.

10.8 Records

The HQ AMD will maintain all records associated with the IAOP.

Chapter 11. Flight Operations Performance Measurements and Reporting

11.1 Purpose

11.1.1 The primary objective of measuring aircraft operations is to provide Agency stakeholders with the key indicators of aircraft operational effectiveness and safety. A secondary objective is to meet the reporting requirements of OMB Circular A-126 and GSA for collection of aircraft information, including aircraft cost data.

11.2 Responsibilities

11.2.1 Center Directors are responsible for reporting the aircraft operational and cost data to the HQ AMD and for ensuring that the reported data is accurate and auditable.

11.2.2 The HQ AMD is responsible for compiling Center inputs into an annual Agency aircraft report, as well as submitting compiled aircraft information to GSA.

11.3 Aircraft Data Reporting Requirements

11.3.1 General. Centers shall use the NASA Aircraft Cost and Performance worksheets in appendix F to report aircraft data to HQ AMD within 45 days after the end of each quarter. [414] Aircraft data must be aggregated to aircraft type and utilization category, i.e. MM, PS, or R&D. For example, some F/A-18 aircraft may be designated as PS aircraft and some may be designated as R&D aircraft. In this case, aircraft data would be separately reported for F/A-18 (PS) and F/A 18 (R&D). Aircraft data reporting consists of the following:

11.3.1.1 Aircraft Inventory Data Reporting. Centers shall use the Aviation Inventory Report worksheet in appendix F to report the number and type of aircraft operated. [415] Aircraft value requested will be the capitalized values recorded in the NEMS database. Additional blank sheets may be used in addition to the comment block of the attached Aviation Inventory Data worksheet to highlight projects, programs, or campaigns supported during the fiscal year. For contracted Commercial Aviation Services (CAS), Centers will provide only the aircraft flown, hours flown, utilization category, program supported, and contract performance period. CAS includes leased aircraft, chartered aircraft, fractional ownership aircraft, otherwise-contracted aircraft, and aircraft services provided by other agencies.

11.3.1.2 Aircraft Performance Data Reporting. The Centers shall use the Aviation Performance Report worksheet in appendix F to report aircraft operational data, unless an Agency-wide aircraft operations data reporting system is utilized. [416] Due to the different natures of aircraft operations, two Aviation Performance Report worksheets will be used--one for MMA and another for PS and R&D Aircraft.

11.3.1.3 Aircraft Safety Data. The Centers shall use the Aviation Safety Report worksheet in appendix F to report aircraft operational safety metrics, unless an Agency-wide aviation safety reporting system is utilized. [417] Costs of mishaps must be reported to the nearest dollar.

11.3.1.4 Aircraft Cost Data Reporting. The Centers shall use the Aviation Financial Report worksheet in appendix F to report aircraft costs, including contracted CAS. [418] Accrued costs, as

opposed to disbursements or obligations, must be reported for each aircraft type operated during the fiscal year. One worksheet will be used to report one aircraft type and mission utilization category. Using the F/A-18 example, one worksheet is to be used for F/A-18 (PS) and another for F/A-18 (R&D). Costs must be reported to the nearest dollar.

a. The first priority in assembling aircraft costs is to extract cost data, using aircraft function codes defined in Volume 2 of NASA's Financial Management Requirements (FMR), from the Core Finance Business Warehouse and to verify the accuracy of the aircraft cost data extracted. While it is not necessary to backtrack and correct the data in the Business Warehouse, any data errors observed in the Business Warehouse and any data adjustments necessary to formulate and report accurate aircraft costs must be documented. Center CFOs shall implement actions to correct any data errors uncovered in the Business Warehouse. [419]

b. In most cases, cost data extracted using aircraft function codes from the Core Finance Business Warehouse should be further broken down and allocated into the reportable aircraft cost categories on the Aviation Financial Report worksheet. Each Center will establish and document local processes and the underlying rationale used to assess the Business Warehouse aircraft cost data into reportable cost categories.

c. The data requested in the Aviation Financial Report worksheet is based on the November 2002 Revision of the U.S. Government Aircraft Cost Accounting Guide published by GSA. The Aviation Financial Data worksheet breaks costs into three broad categories: investment expenditures, fixed costs, and variable costs. Investment expenditures are expenses that lead to ownership of an aircraft or major asset. Fixed costs are those that would be incurred whether aircraft are flown or not. Typical fixed costs are calendar based, e.g., depot maintenance. Variable costs are those incurred as aircraft are flown. Typical variable costs are flight hour based, e.g., fuel.

Chapter 12. Removal From Flight Status

12.1 Purpose

12.1.1 Aircrew members are assigned to flight status with approval from Center Directors and concurrence from HQ AMD and the Center Human Resources Office. Aircrew members may be removed from flight status on a temporary or permanent basis subsequent to mishap or high-visibility Close Call as defined in NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping. These procedures are not intended to replace those applicable to events classified as Close Calls pursuant to NPR 8621.1. Removal from flight status described above does not apply to medical disqualification (temporary or permanent).

12.2 Assignment Procedures

12.2.1 In general, designated NASA pilots/aircrew are those who perform piloting/aircrew duties as a part of their official position description or fly in accordance with an interagency agreement, such as a military pilot on loan to NASA. To be eligible to be assigned to flight status, aircrew members must meet all applicable requirements of chapters 3 and 4 and any additional Center requirements.

12.2.2 Each Center Director and Chief of Flight Operations, in close coordination with the Center Human Resources Office, shall establish a process to designate pilots and aircrew. [420] At a minimum, the process will include reviewing experience, FAA licenses/military designations, and flight logbooks in relation to the Center flight requirements and the applicable requirements of chapters 3 and 4.

12.2.3 Each Center Chief of Flight Operations shall establish procedures for assignment of aircrew to flight status and document those procedures in the Center Aviation Operations Manual. [421] In addition, appropriate documentation should be contained in the aircrew member's official position description per human resources procedures.

12.3 Removal Procedures

12.3.1 Each Center Chief of Flight Operations shall establish procedures for temporary removal of aircrew personnel from flight status for situations other than medical disqualification (chapter 7). [422] These procedures will be coordinated with Center Human Resource and Center Legal Offices. Chiefs of Flight Operations may, after consultation with the Center Legal and Human Resources Offices, remove any aircrew member from flight status for 30 days or less. The Center Director, in accordance with Human Resources procedures, shall review and approve any non-medical-related proposal for removal from flight status in excess of 30 days. [423] Contract employee flightcrew members will be treated in accordance with the terms of the contract under which they are employed.

12.3.2 Prior to any action to removing aircrew members from flight status, the Chief of Flight Operations and Center Director will inform the aircrew member of the circumstances leading to the action. The Center Director and the Chief of Flight Operations in close coordination with the Center Human Resources Office will determine how this action affects the member's ability to perform the duties per the position description.

12.3.3 Removal from flight status can result from either a single event or multiple events that

indicate the aviator has demonstrated:

a. Faulty judgment in flight situations.

b. Lack of general or specific flight skills.

c. Traits of character, emotional tendencies, or lack of mental aptitude or motivation that make it questionable to continue the member in assigned flying duties.

12.3.4 If the reason for removing the individual from flight status is an event that is properly classifiable as a Close Call pursuant to NPR 8621.1, the process for investigation described therein shall be followed. [424] The results of that investigation will be used by management in determining the future assignment of flight duties to an individual that is the subject of an investigation under NPR 8621.1.

12.3.5 Flight Performance Board. A Flight Performance Board may be convened if the Chief of Flight Operations deems the circumstances warrant such action. The board should be convened within 90 days of removal from flight status. The HQ AMD can provide board membership recommendations upon request. The Chief of Flight Operations is the convening authority unless he/she is the direct supervisor of the individual that is the subject of the removal, in which case, the convening authority would be the Center Director. The convening authority will consult with the Center Legal and Human Resources Offices, and HQ AMD prior to establishing a board. Membership will be based upon the circumstances of each individual case. It is preferred that board members have experience as qualified aircrew members and be selected for the board based on their objectivity, experience, and a clear understanding of NASA's aviation mission. No Flight Performance Board should be formed for events that are properly classifiable as a Close Call pursuant to NPR 8621.1.

12.3.5.1 Advisors may be assigned to the board at the discretion of the convening authority. Advisors will perform such duties as the board may require and may be included in deliberations at the board chair's discretion. At a minimum, one from each of the following specialties should be assigned as advisors:

a. Flight surgeon.

b. Legal counsel.

c. Aviator from the Center's flight operations.

12.3.5.2 If a Flight Performance Board is convened, a flight status recommendation shall be delivered to the Center Director. [425] In the event that the Board recommends removal from flight status, the recommendation should include a discussion on extenuation and mitigation factors that addresses the member's rehabilitation value. For example, remediation efforts for "Faulty judgment in flight situations" or "Lack of general or specific flight skills" may be corrected by appropriate training. "Traits of character, emotional tendencies, or lack of mental aptitude or motivation that makes it questionable to continue the member in assigned flying duties" may be remediated through counseling. Prior to permanent removal from flight status, an opportunity should be provided to the member for correcting deficiencies noted by a Flight Performance Board.

Chapter 13. NASA Airfield Operations

13.1 General Requirements

13.1.1 A Center shall not operate an airfield (or helicopter landing area) unless the Center adopts and complies with an Airfield Operations Manual in accordance with Section 13.2 of this NPR. [426]

13.1.2 Each Center operating an airfield shall ensure that the FAA Regional Airports Division Manager is provided a complete copy of the Center's most current Airfield Operations Manual. [427]

13.1.3 Centers providing access to their airfield to the general public for aircraft operations conducted under civil regulations shall identify all deviations and non-compliance from 14 C.F.R. 139 and provide this information to the Office of Infrastructure and Administration for approval. [428] This information also will be provided to all aircraft operators using the airfield.

13.1.4 Centers will establish and maintain a Pre-Mishap Plan/Aircraft Incident Response Plan in accordance with NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping, that meets the following requirements:

13.1.4.1 Each Center shall develop and maintain an airfield emergency plan designed to minimize the possibility and extent of personal injury and property damage on the airfield in an emergency. [429]

13.1.4.2 Each Center shall coordinate the plan with law enforcement agencies, rescue and firefighting agencies, medical personnel and organizations, the principal tenants at the airfield, and all other persons who have responsibilities under the plan. [430]

13.1.4.3 At least once every 12 consecutive calendar months, review the plan with all the parties with whom the plan is coordinated, as specified in this NPR, to ensure that all parties know their responsibilities and to ensure that all information in the plan is current. [431]

13.1.4.4 Each Center shall hold a full-scale airfield emergency plan exercise at least once every 24 consecutive calendar months. [432]

13.1.5 Centers shall conduct training needed to meet the following requirements:

a. Providing sufficient and qualified personnel to comply with the requirements of this NPR.

b. Equipping personnel with sufficient resources to comply with the requirements of this NPR.

c. Training all personnel who access movement areas and safety areas and perform duties in compliance with the requirements of the Airfield Operations Manual and the requirements of this NPR. [433]

13.1.5.1 This training will be completed prior to the initial performance of such duties and at

least once every 12 consecutive calendar months.

13.1.6 All NASA Centers operating airfields or aircraft ramp areas shall conduct a Pavement Condition Index (PCI) survey at least once every five years. [434]

13.1.7 Airfield condition reporting shall be conducted in a manner authorized by the Center Director and meet the following requirements: [435]

a. Provide for the collection and dissemination of airfield condition information to aircraft operators including alerts on bird and other wildlife activity.

b. Use the Notices to Airmen (NOTAM) system, as appropriate, and other systems and procedures authorized by the FAA.

c. Provide information on the following airfield conditions that may affect the safe operations of aircraft:

1. Construction or maintenance activity on movement areas, safety areas, or loading ramps and parking areas.

2. Surface irregularities on movement areas, safety areas, or loading ramps and parking areas.

3. Snow, ice, slush, or water on the movement area or loading ramps and parking areas.

4. Snow piled or drifted on or near movement areas.

5. Objects on the movement area or safety areas.

6. Malfunction of any lighting system, holding position signs, or Instrument Landing System (ILS) critical area signs.

7. Unresolved wildlife hazards.

8. Non-availability of any rescue and firefighting capability required.

9. Any other condition specified in the Airfield Certification Manual or that may otherwise adversely affect the safe operation of aircraft.

10. Procedures for identifying, marking, and lighting construction and other unserviceable areas.

11. Any other item that the Center Director finds is necessary to ensure safety in airfield operations.

13.2 Contents of Airfield Operations Manual

13.2.1 Each Center shall maintain an Airfield Operations Manual that includes descriptions of operating procedures, facilities and equipment, responsibility assignments, and any other information needed by personnel concerned with operating the airfield. [436] Federal Aviation Regulations, FAA Advisory Circulars, and National Fire Protection Association (NFPA) standards contain acceptable methods and procedures for the development of a

Center Airfield Operations Manual.

13.2.2 Each Center shall include in the Airfield Operations Manual the following required elements: [437]

a. Lines of succession of airfield operational responsibility.

b. Copies of current waivers, variances, or deviations issued to the airfield.

c. Any limitations imposed by the Administrator.

d. A grid map or other means of identifying locations and terrain features on and around the airfield that are significant to emergency operations.

e. The location of each obstruction within the airfield's area of authority required to be lighted or marked.

f. A description of all movement areas available for civil and public aircraft operators and the airfield's safety areas, and all roads that serve them.

g. Procedures for avoidance of interruption or failure during construction work of utilities that serve facilities or NAVAIDS that support aircraft operations.

h. A description of airfield personnel training detailed in section 13.1.5.

i. Procedures for maintaining paved areas.

j. Procedures for maintaining unpaved areas.

k. Procedures for maintaining safety areas.

l. A plan showing the runway and taxiway identification system, including the location and inscription of signs, runway markings, and holding position markings.

m. A description of marking, signs, and lighting systems, and procedures for maintaining them.

n. A snow and ice control plan. Prompt notification will be given to all aircraft operators using the airfield when any portion of the movement area is less than satisfactorily cleared for safe operation of their aircraft.

o. A description of the facilities, equipment, personnel, and procedures for meeting the aircraft rescue and firefighting requirements detailed in section 13.3

p. Procedures for protecting persons and property during storing, dispensing, and handling fuel or other hazardous substances and materials.

q. A description of traffic and wind direction indicators and procedures for maintaining them.

r. The Pre-Mishap Plan/Aircraft Incident Response Plan as specified in section 13.1.4.

s. Procedures for conducting a biennial self-inspection program.

t. Procedures for controlling pedestrians and ground vehicles in movement areas and safety

areas.

u. Procedures for obstruction removal, marking, or lighting.

v. Procedures for protection of NAVAIDS.

w. A description of public protection.

x. Procedures for wildlife hazard management as specified in section 13.4.

y. Airfield condition reporting procedures as specified in section 13.1.6.

13.3 Safety and Emergency Requirements

13.3.1 Centers will provide and maintain facilities, equipment, personnel, and procedures for meeting the aircraft rescue and firefighting requirements in accordance with NPR 8715.3, NASA General Safety Program Requirements, and NASA-STD-8719.11, Safety Standard for Fire Protection, for the capacity of aircraft and the level of aircraft operations being conducted at the airfield.

13.3.1.1 Each Center shall provide on the airfield, during aircraft operations at the airfield, at least the rescue and firefighting capability specified for the level of operations. [438]

13.3.1.2 In the event that fire protection is temporarily not available due to lack of personnel, equipment, or other emergencies, the Center must establish procedures to restrict the use of the airfield and notify aircraft operators of the temporary suspension of airfield operations.

13.3.1.3 All rescue and firefighting personnel shall participate in at least one live-fire drill prior to initial performance of rescue and firefighting duties and every 12 consecutive calendar months thereafter. [439]

13.4 Wildlife Hazard Management

13.4.1 Each Center shall take immediate action to eliminate wildlife hazards whenever they are detected. [440]

13.4.2 Each Center shall ensure that a wildlife hazard assessment is conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airfields or an individual working under direct supervision of such an individual. [441]

13.4.3 Each Center shall conduct a training program by a qualified wildlife damage management biologist to provide airfield personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by this chapter. [442]

13.4.4 Each Center shall track and report all bird strikes and other wildlife strikes either in the Incident Reporting Information System (IRIS) or the NASA Aircraft Anomaly Reporting System (NAARS) in accordance with NPR 8621.1. [443]

13.4.5 Each Center shall conduct a periodic review of the bird hazard using a team similar to

the U.S. Air Force Bird/Wildlife Aircraft Strike Hazard (BASH) team. [444]

13.4.6 Each Center shall develop a wildlife hazard management plan using the wildlife hazard assessment as a basis. [445] The plan will:

a. Provide measures to eliminate wildlife hazards to aircraft operations.

b. Become a part of the Airfield Operations Manual.

c. Include a list of the individuals having authority and responsibility for implementing each aspect of the plan.

d. Include a list prioritizing the actions in table 13-1 identified in the wildlife hazard assessment and specifying target dates for their initiation and completion.

e. Provide procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in this section, including the plan's effectiveness in dealing with known wildlife hazards on and in the airfield's vicinity and aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.

1. Wildlife population management.

2. Habitat modification.

3. Land use changes.

4. Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.

5. Identification of resources that the Center will provide to implement the plan.

6. Procedures to be followed during aircraft operations that, at a minimum, include:

(a) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin.

(b) Wildlife hazard control measures.

(c) Methods to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.

(d) Methods for the air traffic control tower to communicate with and provide alerts to aircraft operating in the vicinity of the airfield of wildlife hazards and conditions.

(e) Establishing bird watch conditions to alert crews of the level of potential bird activity.

(f) A standard field brief for all users to view and sign, acknowledging all field operating procedures and hazards at the airfield and local flying area.

Table 13-1 Wildlife Hazard Assessment

13.5 Noncomplying Conditions

13.5.1 Unless otherwise authorized by the Center Director or the FAA (in the case of civil aircraft operations), whenever the requirements of this NPR cannot be met to the extent that uncorrected, unsafe conditions exist on the airfield, the Center shall limit aircraft operations to those portions of the airfield not rendered unsafe by those conditions. [446]

13.6 Deviations

13.6.1 In emergency conditions requiring immediate action for the protection of life or property, the Center may deviate from any requirement of this NPR or the Airfield Operations Manual to the extent required for the emergency. Each Center that deviates from a requirement under this section shall, within 14 days after the emergency, notify HQ AMD of the nature, extent, and duration of the deviation. [447] All events will be reported in accordance with the criteria and IRIS procedures in NPR 8621.1.

Appendix A: Definitions

A.1 **Acquisition**. Any means of bringing an aircraft under NASA control or into the property control inventory.

A.2 **Aircraft Classification**. NASA use of aircraft: Research and Development, Program Support, or Mission Management.

A.3 **Aircraft Inventory.** Aircraft inventory includes active, flyable storage, parts, and display aircraft.

A.4 **Airworthiness**. The capability of an aircraft to be operated within a prescribed flight envelope in a safe manner.

A.5 **Bailed Aircraft**. Any aircraft owned by one entity but under the operational control of another entity for an indefinite period under an agreement that may or may not include financial recompense. Thus, aircraft which are loaned to NASA, or which NASA loans to other entities, are bailed aircraft. As defined by 41 C.F.R. 102-33, Bailed Aircraft means a Federal aircraft that is owned by one executive agency, but is in the custody of and operated by another executive agency under an agreement that may or may not include cost reimbursement. Bailments are executive agency-to-executive agency agreements and involve only aircraft, not services.

A.6 **Borrowed Aircraft**. As defined by 41 C.F.R. 102-33, Borrowed Aircraft are aircraft owned by a non-executive agency and provided to an executive agency for use without compensation. The executive agency operates and maintains the aircraft.

A.7 **Center Chief of Flight Operations**. The Center Chief of Flight Operations is a generic term to indicate that individual who is responsible for overall supervision of all flight operations conducted by that Center, regardless of the specific Center title.

A.8 **Chartered Aircraft**. An aircraft procured under a one-time exclusive agreement that specifies performance and payment. The vendor operates charter aircraft. Note: The preceding Inter-Agency Committee on Aircraft Policy (ICAP) definition does not preclude NASA from specifying what type aircraft they wish to charter nor is a separate agreement required for each flight. As defined by 41 C.F.R. 102-33, Chartered Aircraft are aircraft that an executive agency hires commercially under a contractual agreement specifying performance and one-time exclusive use. The commercial source operates and maintains charter aircraft.

A.9 **Civil Aircraft**. Aircraft that are other than "public" or military aircraft. This includes aircraft engaged in carrying persons or property for commercial purposes, such as air carrier, commuter, charter, and leased aircraft, and Government aircraft carrying passengers.

A.10 **Configuration Control**. Conformity to type design is considered attained when the aircraft configuration and the components installed are consistent with drawings, specifications, and other data that are part of the type certificate and would include any supplemental type certificates and field-approved alterations incorporated into the aircraft.

A.11 **Contracted Aircraft**. An aircraft procured for an agency's exclusive use for a specified period of time by means of a formal contract under which the contractor is responsible for the operation, safety, and maintenance of the aircraft.

A.12 **Crew Duty Time**. The total time a crew is on duty. Crew duty time accrues consecutively and begins when a crew reports to a designated place of duty to begin preparation for a flight and ends

when the engines are cut at the end of the flight or series of flights.

A.13 **Crew Rest**. The total time flightcrew members are assigned no official duties to provide for adequate rest. This includes crew transportation prior to participating in flightcrew duties.

A.14 **Disposition**. Any means of deleting an aircraft from NASA control or from the property control inventory.

A.15 **Flight Envelope**. Aircraft performance limits or limitations approved by the aircraft manufacturer, DoD, FAA, or established by a formal NASA airworthiness review.

A.16 **Functional Check Flight Pilot**. A PIC who is adequately trained and authorized by the Center Chief of Flight Operations to conduct Functional Check Flights of Center aircraft.

A.17 **Hazard Analysis**. The technique used to systematically identify, evaluate, resolve, and assess hazards.

A.18 **Instructor Pilot**. A qualified PIC who is designated by NASA to perform the functions of an instructor in the aircraft. An IP is qualified to instruct and evaluate other pilots.

A.19 **Leased Aircraft**. An aircraft that the Government has exclusive right (through a financial contract) to use for a specific period of time and for which the procuring agency is responsible for the operation and safety of the aircraft. Maintenance responsibility is defined under the terms of the contract. As defined by 41 C.F.R. 102-33, Leased Aircraft are aircraft hired under a commercial contractual agreement in which an executive agency has exclusive use of the aircraft for an agreed-upon period of time. The acquiring executive agency operates and maintains the aircraft.

A.20 **Loaned Aircraft**. An aircraft owned by one entity but under the operational control of another agency under an agreement that does not include financial recompense. As defined by 41 C.F.R. 102-33, Loaned Aircraft are Federal aircraft owned by an executive agency but in the custody of a non-executive agency under an agreement that does not include compensation.

A.21 **Maintenance**. Scheduled or unscheduled work on an aircraft that is required to attain or to sustain a state of airworthiness and meets all required standards, practices, and guidelines for airworthiness.

A.22 **Mission Management Aircraft**. Those administrative aircraft certified by the FAA and used primarily for passenger transport.

A.23 **Mission Required**. MMA flights where failure to use a NASA MMA would have a clear, negative impact on a NASA operational mission, prevent timely response to an aircraft or spacecraft accident, or threaten the health and safety of NASA personnel, and only when such travel could not be conducted using commercial airlines, charter aircraft service, or ground transportation to fulfill that mission need.

A.24 **Modification**. Any alteration, addition, or removal of aircraft structure, components, equipment, computer software, or primary instrumentation.

A.25 **NASA Aircraft**. Aircraft that are bought, borrowed, chartered, rented, or otherwise procured or acquired--including aircraft produced with the aid of NASA funding--regardless of cost, from any source for the purpose of conducting NASA science, research, or other missions, and which are operated by NASA or whose operation is managed by NASA.

A.26 **NASA Inter-Center Aircraft Operations Panel**. The IAOP is composed of the Chiefs of Flight Operations from Centers that operate aircraft, representatives from HQ AMD, advisors from appropriate Centers, and the Office of Safety and Mission Assurance.

A.27 **Other Official Travel**. MMA flights that are not classified as Required Use or Mission Required.

A.28 **NASA Pilot**. Pilots who perform piloting duties as a part of their official NASA position description to fulfill NASA contract requirements or in accordance with an interagency agreement, such as a military pilot on loan to NASA.

A.29 **Pilot Flying**. The pilot physically controlling the aircraft by hand-flying it or manipulating the controls through the autopilot.

A.30 **Pilot in Command**. A NASA pilot who holds the appropriate category, class, and, if appropriate, type rating or military qualification for the aircraft and is qualified in its operation by appropriate Center or MMA directives. The PIC has final authority and responsibility for the operation and safety of the flight.

A.31 **Pilot Monitoring**. The pilot not currently flying the aircraft but who is monitoring the other pilot's and the aircraft's performance and position.

A.32 **Primary Aircrew**. The required pilot(s), flight engineer, and any other aircrew member so designated by the Center.

A.33 **Program Support Aircraft**. Aircraft used to support programs and operations other than the direct production and acquisition of data.

A.34 **Public Aircraft**. Aircraft used only in the service of a Government or a political subdivision. It does not include Government owned aircraft engaged in carrying persons or property for commercial purposes.

A.35 **Qualified Non-Crewmember**. An individual other than a member of the crew whose presence is required to perform, or is associated with the performance of, the mission the aircraft is supporting.

A.36 **Quality Assurance**. The act of attaining certainty that maintenance performed on aircraft meets all required airworthiness standards, regulations, practices, and guidelines.

A.37 **Required Use**. MMA flights where the use of Government aircraft is required because of bona fide communications or security needs or exceptional scheduling requirements.

A.38 **Research and Development Aircraft**. All aircraft directly related to the production or acquisition of data.

A.39 **Second in Command**. A NASA Pilot who is qualified by NASA to be SIC of an aircraft by appropriate Center or MMA directives.

A.40 **State Aircraft**. Public aircraft operating in international airspace

Appendix B Flight on Public Aircraft

B-1 Flying on Public Aircraft (Crewmembers and Qualified Non-Crewmembers)

Subject: Disclosure Statement for Crewmembers and Qualified Non-Crewmembers Flying on Board Government Aircraft Operated as Public Aircraft.

Reference: 41 C.F.R. 102-33, Management of Government Aircraft, section 102-33.165;(e)

Crewmembers and qualified non-crewmembers flying on board Government aircraft operated as either civil or public aircraft on the behalf of NASA shall have on file in Flight Operations a record of acknowledgement of the following disclosure statement:

Generally, an aircraft used exclusively for the U.S. Government may be considered a "public aircraft" as defined in Public Law 106-181, provided it is not a Government-owned aircraft transporting passengers or operating for commercial purposes. A public aircraft is not subject to many Federal Aviation Regulations, including requirements relating to aircraft certification, maintenance, and pilot certification. If an agency transports passengers on a Government-owned aircraft or uses that aircraft for commercial purposes, the agency must comply with all Federal Aviation Regulations applicable to civil aircraft. If you have any questions concerning whether a particular flight will be a public aircraft operation or a civil aircraft operation, you should contact the agency sponsor of that flight.

You have certain rights and benefits in the unlikely event you are injured or killed while working aboard a Government-owned or operated aircraft. Federal employees and some private citizens are eligible for workers' compensation benefits under the Federal Employees' Compensation Act (FECA). When FECA applies, it is the sole remedy. For more information about FECA and its coverage, consult with your agency's benefits office or contact the Branch of Technical Assistance at the Department of Labor's Office of Workers' Compensation Programs at (202) 693-0044.

State or foreign laws may provide for product liability or "third party" causes of actions for personal injury or wrongful death. If you have questions about a particular case or believe you have a claim, you should consult with an attorney.

Some insurance policies may exclude coverage for injuries or death sustained while working or traveling aboard a Government or military aircraft or while within a combat area. You may wish to check your policy or consult with your insurance provider before your flight. The insurance available to Federal employees through the Federal Employees Group Life Insurance Program does not contain an exclusion of this type.

If you are the victim of an air disaster resulting from criminal activity, Victim and Witness Specialists from the Federal Bureau of Investigation (FBI) and/or the local U.S. Attorney's Office will keep you or your family informed about the status of the criminal investigation(s) and provide you or your family with information about rights and services, such as crisis intervention, counseling, and emotional support. State crime victim compensation may be

able to cover crime-related expenses, such as medical costs, mental health counseling, funeral and burial costs, and lost wages or loss of support. The Office for Victims of Crime (an agency of the Department of Justice) and the U.S. Attorneys Office are authorized by the Antiterrorism and Effective Death Penalty Act of 1996 to provide emergency financial assistance to State programs for the benefit of victims of terrorist acts or mass violence.

If you are a Federal employee. If you are injured or killed on the job during the performance of duty, including while traveling or working aboard a Government aircraft or other Government-owned or -operated conveyance for official Government business purposes, you and your family are eligible to collect workers' compensation benefits under FECA. You and your family may not file a personal injury or wrongful death suit against the United States or its employees. However, you may have cause of action against potentially liable third parties.

You or your qualifying family member must normally also choose between FECA disability or death benefits, and those payable under your retirement system (either the Civil Service Retirement System or the Federal Employees Retirement System). You may choose the benefit that is more favorable to you.

If you are a private citizen not employed by the Federal Government. Even if the Federal Government does not regularly employ you, if you are rendering personal service to the Federal Government on a voluntary basis or for nominal pay, you may be defined as a Federal employee for purposes of FECA. If that is the case, you and your family are eligible to receive workers' compensation benefits under FECA, but may not collect in a personal injury or wrongful death lawsuit against the United States or its employees. You and your family may file suit against potentially liable third parties. Before you board a Government aircraft, you may wish to consult with the department or agency sponsoring the flight to clarify whether you are considered a Federal employee.

If the agency determines that you are not a "Federal employee," you and your family will not be eligible to receive workers' compensation benefits under FECA. If you are onboard the aircraft for purposes of official Government business, you may be eligible for workman's compensation benefits under state law. If an accident occurs within the United States or its territories, its airspace, or over the high seas, you and your family may claim against the United States under the Federal Tort Claims Act or Suits in Admiralty Act. If you are killed aboard a military aircraft, your family may be eligible to receive compensation under the Military Claims Act, or if you are an inhabitant of a foreign country, under the Foreign Claims Act.

NOTE: This disclosure statement is not all-inclusive. You should contact your agency's personnel office, or if you are a private citizen, your agency sponsor or point of contact for further assistance.

B-2 Flying on Public Aircraft (Passengers)

Subject: Disclosure Statement for Passengers Flying on Board Government Aircraft Operated as Public Aircraft.

Reference: 41 C.F.R. 300.3, 301.10, and 301.70, Federal Travel Regulation (FTR), Section

301-70.909

Passengers Flying on board Government Aircraft operated on the behalf of NASA will have been briefed on the following disclosure statement, and a single-sheet laminated copy of the following disclosure statement shall be made available at each passenger seat. Each passenger manifest shall be annotated that all passengers were briefed on their rights and benefits.

DISCLOSURE FOR PERSONS FLYING ABOARD FEDERAL GOVERNMENT AIRCRAFT

(41 CFR 300.3, 301.10, and 301.70, Federal Travel Regulation (FTR), Section 301-70.909)

NOTE: The disclosure contained herein is not all-inclusive. You should contact your sponsoring agency for further assistance.

Generally, an aircraft used exclusively for the U.S. Government may be considered a 'public aircraft' as defined in 49 U.S.C. 40102 and 40125, unless it is transporting passengers or operating for commercial purposes. A public aircraft is not subject to many Federal aviation regulations, including requirements relating to aircraft certification, maintenance, and pilot certification. If a U.S. Government agency transports passengers on a Government aircraft, that agency must comply with all Federal aviation regulations applicable to civil aircraft. If you have questions about the status of a particular flight, you should contact the agency sponsoring the flight.

You and your family have certain rights and benefits in the unlikely event you are injured or killed while riding aboard a Government aircraft. Federal employees and some private citizens are eligible for workers' compensation benefits under the Federal Employees' Compensation Act (FECA). When FECA applies, it is the sole remedy. For more information about FECA and its coverage, consult with your agency's benefits office or contact the Branch of Technical Assistance at the Department of Labor's Office of Workers' Compensation Programs at (202) 693-0044. (These rules also apply to travel on other Government-owned or operated conveyances such as cars, vans, or buses.)

State or foreign laws may provide for product liability or ``third party' causes of actions for personal injury or wrongful death. If you have questions about a particular case or believe you have a claim, you should consult with an attorney. Some insurance policies may exclude coverage for injuries or death sustained while traveling aboard a Government or military aircraft or while within a combat area. You may wish to check your policy or consult with your insurance provider before your flight. The insurance available to Federal employees through the Federal Employees Group Life Insurance Program does not contain an exclusion of this type.

If you are the victim of an air disaster resulting from criminal activity, Victim and Witness Specialists from the Federal Bureau of Investigation (FBI) and/or the local U.S. Attorney's Office will keep you or your family informed about the status of the criminal investigation(s) and provide you or your family with information about rights and services,

such as crisis intervention, counseling and emotional support. State crime victim compensation may be able to cover crime-related expenses, such as medical costs, mental health counseling, funeral and burial costs, and lost wages or loss of support. The Office for Victims of Crime (an agency of the Department of Justice) is authorized by the Antiterrorism Act of 1996 to provide emergency financial assistance to state programs, as well as the U.S. Attorneys Office, for the benefit of victims of terrorist acts or mass violence.

If you are a Federal employee:

1. If you are injured or killed on the job during the performance of duty - including while traveling aboard a Government aircraft or other government-owned or operated conveyance for business purposes, you and your family are eligible to collect workers' compensation benefits under FECA. You and your family may not file a personal injury or wrongful death suit against the United States or its employees. However, you may have cause of action against potentially liable third parties.

2. You or your qualifying family member must normally also choose between FECA disability or death benefits, and those payable under your retirement system (either the Civil Service Retirement System or the Federal Employees Retirement System). You may choose the benefit that is more favorable to you.

If you are a private citizen not employed by the Federal Government:

1. Even if you are not regularly employed by the Federal Government, if you are rendering personal service to the Federal Government on a voluntary basis or for nominal pay, you may be defined as a Federal employee for purposes of FECA. If that is the case, you and your family are eligible to receive workers' compensation benefits under FECA, but may not collect in a personal injury or wrongful death lawsuit against the United States or its employees. You and your family may file suit against potentially liable third parties. Before you depart, you may wish to consult with the department or agency sponsoring the flight to clarify whether you are considered a Federal employee.

2. If there is a determination that you are not a Federal employee, you and your family will not be eligible to receive workman's compensation benefits under FECA. If you are traveling for business purposes, you may be eligible for workman's compensation benefits under state law. If the accident occurs within the United States, or its territories, its airspace, or over the high seas, you and your family may claim against the United States under the Federal Tort Claims Act or Suits in Admiralty Act. If you are killed aboard a military aircraft, your family may be eligible to receive compensation under the Military Claims Act, or if you are an inhabitant of a foreign country, under the Foreign Claims Act.

Appendix C Inter-Center Aircraft Operations Review Plan

Action Item	Responsible Party	Timing
Update annual schedule, Designate Team Leaders, and assign Inter-Center team members	IAOP Chairman/HQ AMD	Yearly, amended as required
Notify team members, request travel orders	HQ AMD /Team Leader	6-8 weeks before review
Letter to Center Director	HQ AMD	4-6 weeks before review
Team Leader packet containing IAOP checklist and recent reviews	HQ AMD	2-4 weeks before review
Entrance briefing	Team Leader	First day of review
Center briefing	Applicable Center	First day of review
Individual observations and recommendations	Team Member	During review
Exit briefing	Team Leader	Last day of review
Write review report and forward to HQ AMD	Team Leader/ HQ AMD assist	2-4 weeks after review
Forward Final Report to Center Director	HQ AMD Signature	Within 1 week
Center Director forwards review report response to AA I&A	Applicable Center	12 weeks after receipt of report
Analyze response for adequacy, followup, tracking, and closure.	HQ AMD	As necessary

Appendix D NASA Inter-Center Aircraft Operations

Program Review Sheet

FACILITY:

DATE:

AREA REVIEWED: MANAGEMENT OPERATIONS

AVIATION SAFETY AVIONICS QA

AIRCRAFT MAINTENANCE FACILITIES

AIRWORTHINESS/FLIGHT READINESS HAZARD ANALYSIS

MAINTENANCE FACILITIES MAINTENANCE TRAINING

SECURITY MMA OPERATIONS

TEAM MEMBER: **LOCAL CONTACT:**

OBSERVATION TITLE:

OBSERVATION (Factual Information):

REQUIRED ACTION, RECOMMENDATION, OR COMMENDABLE FINDING:

Appendix E Certificate of Airworthiness for Aircraft

United States of America

National Aeronautics and Space Administration

Certificate of Airworthiness

1. NATIONALITY/REGISTRATION MARKS	2. MANUFACTURER AND MODEL	3. AIRCRAFT SERIAL NUMBER	4. CATEGORY

5. AUTHORITY AND BASIS FOR ISSUANCE

The aircraft described hereon is operated by NASA under the authority of US Public Law 85-568, The National Aeronautics and Space A
and certified under NASA Policy Directive 7900.4. Under ICAO regulations, it is operated as a State-owned aircraft.

THIS CERTIFIES THAT, AS OF THE DATE OF ISSUANCE, THE AIRCRAFT TO WHICH ISSUED HAS BEEN INSPECTED AND FOUND TO
CONDITION FOR SAFE OPERATION. FOR OPERATIONS OUTSIDE THE AIRSPACE OF THE UNITED STATES, IT HAS BEEN SHOWN
NASA TO MEET THE REQUIREMENTS OF THE DETAILED AIRWORTHINESS CODE AS PROVIDED BY ANNEX 8 OF THE CONVENTIO
INTERNATIONAL CIVIL AVIATION, EXCEPT AS NOTED HEREIN.

EXCEPTIONS: *(NONE)*

6. DATE OF ISSUANCE	7. NASA AIRWORTHINESS REVIEW OFFICER	8. CENTER DIRECTOR'S APPROVA

ftp://ftp.hq.nasa.gov/forms/pdf/nf1677.pdf

Appendix F NASA Aircraft Cost and Performance Worksheets

NASA Aircraft Cost and Performance Data Worksheets

Purpose:

The primary objective of measuring aircraft operations is to provide to Agency stakeholders the key indicator operational scope, effectiveness, efficiency, and safety. In addition to the basic aviation metrics established b document, aviation metrics and performance objectives specific to Agency programs and projects shall be est on program or project requirements and reported to the program or project managers as needed.

A second objective in assembling Agency aircraft operations results and metrics is to comply with Office of M and Budget (OMB) Circular A-126, wherein Federal agencies are required to cooperate with the General Serv Administration (GSA) for collection of aircraft information, including aircraft cost data.

General Instructions:

(1) **The following data shall be submitted quarterly, no later than 45 calendar days after the end of eac**

(2) **Aircraft Inventory Data.** Please use the attached Aviation Inventory Report form to report aircraft oper fiscal year. Aircraft value requested shall be based on NEMS database. Additional blank sheets may be addition to the comment block of the attached Aviation Inventory Data form to list projects, programs an supported during the fiscal year. For contracted Commercial Aviation Services (CAS), please annotate t the contract or service agreement in the Additional Narrative section. Aircraft Value is not required for C

(3) **Aircraft Performance Data.** Please use the attached Aviation Performance Report forms to report aircr results for the fiscal year. Due to the different natures of aircraft operations, two Aviation Performance R are to be used – one for Mission Management Aircraft and another for Program Support (PS) and Resear Development (R&D) Aircraft. For contracted Commercial Aviation Services (CAS) aircraft used to perf functions, Maintenance Down Time is not required.

(4) **Aircraft Safety Data.** Please use the attached Aviation Safety Report form to report aircraft operational for the fiscal year, including contracted Commercial Aviation Services (CAS). Costs of mishaps shall be **the nearest dollar**. Extenuating circumstances in aborted missions shall be provided in the comment blo Aviation Safety Report Form.

(5) **Aircraft Cost Data.** Please use the attached Aviation Financial Report form to report aircraft costs for t including contracted Commercial Aviation Services (CAS). Costs, as opposed to disbursements or oblig **reported to the nearest dollar** for each aircraft type operated during the fiscal year. **One form shall be one aircraft type and mission utilization category.** Using the F/A-18 example, one form is to be used (PS) and another for F/A-18 (R&D).

While the aircraft cost data requested stems primarily from OMB Circular A-126 cost data requirements, Financial Data Report form that follows this cover page have been streamlined as much as possible. In e are separated into three broad categories: Investment Expenditures, Fixed Costs, and Variable Costs. Fix those that would be incurred whether aircraft are flown or not. Typical fixed costs are calendar based, e.g maintenance. Variable costs are those incurred as aircraft are flown. Typical variable costs are flight hou

cycle based, e.g. fuel.

Not all aircraft costs are typically captured or reported by the Centers' Aircraft Offices. Collaboration be
cognizant offices is likely required in order to assemble the total aircraft cost picture at each Center.

F -1 NASA Aircraft Cost and Performance Worksheets

Fiscal Year ____ Quarter _____ Aviation Inventory Worksh

Center:

Aircraft	Qty	Utility Designation (MM/PS/R&D)	Capitalized Aircraft Value	Programs/Projects/Campaigns Su
TOTAL				

Additional Narrative: (Comments, Explanation of Acronyms, Significant Accomplishments, Etc.)

F-2 NASA Aircraft Cost and Performance Worksheets

Fiscal Year ____ Quarter _____ Aviation Performance Worksh
(Mission Management Aircraft)

Center:

Aircraft	Flight Hours Flown	Sorties Flown	Sorties Aborted (Due to Acft)	Sorties Aborted (Not Due to Acft)	Maint. Down Time (Hours)	Pax. Flown	Pax.-M Flow
TOTAL							

Additional Narrative: (Amplifications, Comments, Etc.)

F-3 NASA Aircraft Cost and Performance Worksheets

Fiscal Year ___ Quarter _____ Aviation Performance Works

(Program Support and Research & Development Aircraft)

Center:

Aircraft	Utility Designation (PS or R&D)	Flight Hours Flown	R&D Ground Time* (Hours)	Sorties Flown	Sorties Aborted (D to Acft)
TOTAL					

Additional Narrative: (Amplifications, Comments, Etc.)

F-4 NASA Aircraft Cost and Performance Worksheets

Fiscal Year ___ Quarter _____ Aviation Safety Workshe

Center:

Aircraft	Qty	Utility Designation (MM/PS/R&D)	Type A Mishaps	Type B Mishaps	Type C Mishaps	Type D Mishaps
TOTAL						

Additional Narrative: (Amplifications, Comments, Etc.)

F-5 NASA Aircraft Cost and Performance Worksheets

Fiscal Year ___ Quarter _____ Aircraft Financial Data Work					
Center:		Aircraft Type & Utility Designation:		Quantity:	
Cost Categories and Elements				Paid T Federal/Internal	
Aircraft Ownership Investments					
Aircraft Purchase Costs					
Lease to Own & Fractional Ownership - Ownership Costs					
Permanent Mods & Upgrades Costs					
Aircraft Support Assets (SE, Tools, etc.)					
Total Investment Expenditures				$ -	
Aircraft Operation Costs - Fixed Costs					
Administrative Overhead					
- HQ G&A					
- Center G&A					
Aviation Operation Overhead					
- Direct Aircraft Management/Support Personnel Salaries					
- Costs Service Pool Personnel Supporting Aircraft Management/Operations					
- Home Base Facilities, Airport fees, IT Services, Utilities, Etc.					
Flight Crew Costs - Fixed					
- Flight Crew Salaries & Benefits					
- Flight Crew Currency & Qualification Training					
Maintenance - Fixed				$ -	
Maintenance Labor - Fixed					
- Government & Contractor Maintenance Crew Salaries & Benefits					
- Government & Contractor Maintenance Crew Currency & Qualification Training					
Maintenance Parts/Contracts - Fixed					
- Parts for Maintenance Scheduled on Calendar Basis					
- Contracted Maintenance Actions Scheduled on Calendar Basis					
Commercial Aviation Service (Fractional, Lease, Etc.) - Fixed					
Other Fixed Operating Costs					
- Insurance					
- Depreciation					
- Other					
Total Fixed Costs				$ -	
Aircraft Operation Costs - Variable Costs					
Maintenance - Variable					
- Labor Not Accounted For In Fixed Maintenance Labor					
- Consumables & Parts					
- Maintenance Based on Flight Hours/Cycles, Including Engine O/H, HIS, and Acft Refurb.					
- Unscheduled Maintenance/Repair					
POL					

Commercial Aviation Service (Fractional, Lease, Etc.) - Variable Mission Related Costs	

Appendix G Sample Approval Request to Acquire/Transfer/Dispose of Aircraft

TO: Assistant Administrator for Infrastructure and Administration

FROM: Director, (NASA Center)

SUBJECT: Request Approval to Acquire/Transfer/Dispose (number) (type) Aircraft

Statement of Need. This should be a summary of the reasons for acquiring/transferring/disposing the aircraft, including the Program and primary requirements it will satisfy, or in the case of support, the secondary or derived requirements (such as chase, pilot training, cargo), or, on the other hand, discontinued requirements.

Estimated Acquisition/Transfer/Disposal Cost. This should include all the costs associated with providing a resource ready for use by the program. It could be divided into two distinct areas which differentiate the costs associated with obtaining the basic aircraft and placing it into flying condition (such as engine overhauls, aircraft inspections, and PDM/SDLM), and the costs of modifying the aircraft to meet generic research or program support requirements, which can be applied to any number of programs (including TCAS or Reduced Vertical Separation Minimum (RVSM) upgrades, or aircraft system modifications that make it a better platform in general). These costs should not include the costs of specific research equipment or aircraft modifications that will not be permanent.

Estimated Support Cost. Include an estimate of the costs associated with any increase in civil servant or contractor staffing, additional equipment, increased inventory, additional storage or other support facilities, and any other increase in fixed costs. It also should include an estimate of the annual operating (variable) costs.

Method of Funding. Describe how the aircraft acquisition and support will be acquired, i.e., via purchase or lease through normal procurement or via surplus, bail, or loan from another agency. Also include the program fund source.

Logistic Support. Describe how the aircraft will be supported logistically, e.g., organic support within the Center (including existing support contracts); through a new contract; or through an MOA with another Center, DoD, or another Federal agency. Describe any continuing logistic support requirements for disposal requests.

Environmental Impact. Describe projected environmental impact(s) of the aircraft acquisition/transfer/disposal.

Center Point of Contact: Name, phone number, and e-mail address of the POC at the Center.

Appendix H Acronyms

A&P	Airframe and Power Plant.
ACA	Airspace Coordination Areas.
AD	Airworthiness Directives.
AFSRB	Airworthiness and Flight Safety Review Board.
AGL	Above Ground Level.
AMD	Aircraft Management Division.
AME	Aviation Medical Examiner.
AO	Area of Operations.
ARB	Airworthiness Review Board.
ARP	Airworthiness Review Process.
ASM	Aviation Safety Manager.
ASO	Aviation Safety Officer.
ATC	Air Traffic Control.
ATP	Airline Transport Pilot.
BASH	U.S. Air Force Bird/Wildlife Aircraft Strike Hazard.
BCA	Business Case Analysis.
CAS	Commercial Aviation Services.
CFR	Crash Fire Rescue.
CFO	Chief Financial Officer.
CONUS	Continental United States.
COTR	Contracting Officer Technical Representative.
CVR	Cockpit Voice Recorder.
DA	Decision Altitude.
DoD	Department of Defense.

DOT	Department of Transportation.
EGPWS	Enhanced Ground Proximity Warning System.
EOP	Executive Office of the President.
ETA	Estimated Time of Arrival.
FAA	Federal Aviation Administration.
FAIRS	Federal Aviation Interactive Reporting System.
FAR	Federal Aviation Regulations.
FBI	Federal Bureau of Investigation.
FCG	Foreign Clearance Guide.
FDR	Flight Data Recorder.
FECA	Federal Employees' Compensation Act.
FMR	Financial Management Requirements.
FOD	Foreign Object Damage.
FRR	Flight Readiness Review.
FTR	Federal Travel Regulation.
GCS	Ground Control Station.
GPS	Global Positioning System.
GSA	General Services Administration.
HQ	Headquarters.
HN	Host Nation.
IAOP	Inter-Center Aircraft Operations Panel.
ICAO	International Civil Aviation Organization.
ICAP	Inter-Agency Committee on Aircraft Policy.
ILS	Instrument Landing System.
IP	Instructor Pilot.
IRIS	Incident Reporting Information System.

JPL	Jet Propulsion Laboratory.
LOFT	Line Oriented Flight Training.
MDA	Minimum Descent Altitude.
MEL	Minimum Equipment List.
MMA	Mission Management Aircraft.
MOA	Memorandum of Agreement.
MOU	Memorandum of Understanding.
MRR	Mission Readiness Review.
MSL	Mean Sea Level.
NAARS	NASA Aircraft Anomaly Reporting System.
NALCOMIS	Naval Aviation Logistics Command Management Information System.
NAMIS	NASA Aircraft Management Information System.
NAS	National Airspace.
NAVAIDS	Navigational Aids.
NESC	NASA Engineering Safety Center.
NEMS	NASA Equipment Management System.
NFPA	National Fire Protection Association.
NOTAM	Notices to Airmen.
NPR	NASA Procedural Requirement.
NTSB	National Transportation Safety Board.
OEM	Original Equipment Manufacturer.
OSHA	Occupation Safety and Health Administration.
OMB	Office of Management and Budget.
ORR	Operations Readiness Review.
OSMA	Office of Safety and Mission Assurance.
OTI	One-Time Inspections.

PCI	Pavement Condition Index.
PCS	Portable Control Station.
PIC	Pilot in Command.
PPB	Power Plant Bulletin.
PPC	Power Plant Change.
PS	Program Support.
R&D	Research and Development.
RA	Resolution Advisories.
RC	Radio Control.
ROA	Restricted Operations Areas.
ROZ	Restricted Operations Zones.
RVR	Runway Visual Range.
RVSM	Reduced Vertical Separation Minimum.
SB	Service Bulletin.
SES	Senior Executive Service.
SI	Service Instruction.
SIC	Second in Command.
SM	Statute Mile.
SODA	Statements of Demonstrated Ability.
STC	Supplemental Type Certificate.
TAWS	Terrain Awareness and Warning System.
TCAS	Traffic Alert and Collision Avoidance System.
TCTO	Time Compliant Technical Order.
TD	Technical Directive.
TO	Technical Order.
UAS	Unmanned Aerial System.

Appendix I Compliance Matrix

Req #	NPR P	Requirement Statement	Responsible Party	Method to Ensure Compliance
01	1.1.5	NASA aircraft pilots shall secure diplomatic clearance approval prior to entry into the airspace of a foreign country except for brief use of foreign airspace adjoining the United States as directed by air traffic control.	NASA aircraft pilots	IAOP Review
02	1.1.6	For each Center operating aircraft/UASs or procuring aircraft/UAS services, the Center Director shall maintain a program-independent Flight Operations Office, the specific purpose of which will be to plan, organize, direct, and control the operations, maintenance, modification, safety, and support of all Center-assigned or -contracted aircraft.	Center Directors	IAOP Review
03	1.1.6	The head of this office shall be the senior line manager who is responsible for aviation activities at the Center.	Center Directors	IAOP Review
04	1.1.6	The Center Director shall assign the head of the Flight Operations Office the authority and responsibility, and provide the resources necessary to manage and conduct safe, effective, and efficient operations in accordance with NASA directives, guidance, and other applicable Federal regulations.	Center Directors	IAOP Review

05	1.1.6.1	Prior to contract award, the head of the Flight Operations Office shall review and concur upon any Center contract or agreement that includes aviation operations.	Center Chief of Flight Operations	IAOP Review
06	1.1.6.2	If a Center does not have a Flight Operations Department, the Center Director shall have another Center's Flight Operations Department review and concur on such contracts or agreements for them each time they procure aviation services.	Center Director	IAOP Review
07	1.2.1	The Assistant Administrator for the Office of Infrastructure and Administration shall designate aircraft classifications and assign aircraft to the appropriate Center after consultation with the affected Mission Directorates and Center Directors.	Assistant Administrator for the Office of Infrastructure and Administration	Flight Operations Performance Measurements and Reporting
08	1.2.1	Records created throughout flight operations management shall be maintained, managed, and disposed of by each Center's Flight Operations Office or designated office in accordance with NPR 1441.1, NASA Records Retention Schedules.	Center Chief of Flight Operations	IAOP Review
09	1.2.2.1	Mission Directorate Associate Administrators shall coordinate early with the Office of Infrastructure and Administration to establish program or project plans involving the requirement for acquisition or use of aircraft, including UASs.	Mission Directorate Associate Administrators	Flight Operations Performance Measurements and Reporting

10	1.2.2.2	Mission Directorate Associate Administrators shall comply with OMB Circulars A-76 and A-126 as they apply to the acquisition of aircraft/UASs and coordinate related documentation requirements with the Assistant Administrator for the Office of Infrastructure and Administration.	Mission Directorate Associate Administrators	Flight Operations Performance Measurements and Reporting
11	1.2.2.3	Mission Directorate Associate Administrators shall annually review aircraft mission and program requirements, use, and associated costs, and project those requirements and costs over five years in an annual report to the HQ AMD not later than September 30 of each year.	Mission Directorate Associate Administrators	Flight Operations Performance Measurements and Reporting
12	1.2.2.4	Mission Directorate Associate Administrators shall submit OMB Circular A-11, Exhibit 300, for aircraft and aircraft programs funded by their Directorate. These submissions shall be coordinated with the Office of Infrastructure and Administration and the Office of the Chief Financial Officer.	Mission Directorate Associate Administrators	Flight Operations Performance Measurements and Reporting
13	1.2.3.1	Center Directors shall be responsible for the airworthiness and flight safety of assigned aircraft, including UASs.	Center Directors	IAOP Review
14	1.2.3.2	Center Directors shall be responsible for coordination with the Office of Infrastructure and Administration in establishing program or project plans involving the requirement, assignment, and operation of aircraft/UASs.	Center Directors	IAOP Review

15	1.2.3.3	Center Directors shall be responsible for annually reviewing aircraft mission and program requirements (for those programs controlled/funded by their respective Center), use, and associated costs, and projecting those requirements and costs over five years in an annual report to the HQ AMD not later than September 30 of each year.	Center Directors	IAOP Review
16	1.2.3.4	Center Directors shall be responsible for ensuring compliance with the Financial Management Requirements in the appropriate use and application of function codes that are used to account for, track, and report aircraft costs.	Center Directors	IAOP Review
17	1.2.3.5	Center Directors shall be responsible for quarterly reporting of aircraft operations and costs to Headquarters, as stipulated in chapter 11 and specific MMA reporting requirements detailed in chapter 4 of this NPR.	Center Directors	IAOP Review
18	1.2.3.6	Center Directors shall be responsible for ensuring compliance with 41 C.F.R. S102-33, 41 C.F.R. S 300/301, and OMB Circular A-126.	Center Directors	IAOP Review
19	1.2.3.7	Center Directors shall be responsible for the budget for personnel and travel in support of the IAOP.	Center Directors	IAOP Review
20	1.2.3.8	Center Directors shall be responsible for approving aircraft charters or leases for periods of 30 days or less with seven days prior notice to the	Center Directors	IAOP Review

		HQ AMD within the Office of Infrastructure and Administration.		
21	1.2.3.9	Center Directors shall be responsible for the technical assessment, cost evaluation, acquisition, use, and disposition of all aircraft/UASs under their control.	Center Directors	IAOP Review
22	1.2.3.9	Center Directors shall coordinate and submit all aircraft acquisition and disposition proposals to the Assistant Administrator for the Office of Infrastructure and Administration for approval.	Center Directors	IAOP Review
23	1.2.3.9	Center Directors shall report all acquisition and disposal actions to the HQ AMD to comply with Federal aircraft data reporting requirements.	Center Directors	IAOP Review
24	1.2.3.10	Center Directors shall be responsible for ensuring that Center managers who acquire aircraft/UAS or aviation services coordinate those acquisitions with the Center's Flight Operations Department to ensure compliance with the NASA Aviation Safety Program and aircraft management policies.	Center Directors	IAOP Review
25	1.2.4.1	Program/project managers shall coordinate early with the Office of Infrastructure and Administration to establish program or project plans involving the requirement for acquisition or use of aircraft, including UASs.	Program/project managers	Flight Operations Performance Measurements and Reporting

26	1.2.4.2	Program/project managers shall prepare a Business Case Analysis in accordance with OMB Circulars A-11, A-76, and A-126 prior to the acquisition of aircraft/UASs and gain approval of the BCA by the cognizant Mission Directorate Associate Administrator and the Assistant Administrator for the Office of Infrastructure and Administration.	Program/project managers	Flight Operations Performance Measurements and Reporting
27	1.2.4.3	Program/project managers shall annually review aircraft mission and program requirements, use, and associated costs and project those requirements and costs over five years to support the Mission Directorate's annual report to the HQ AMD not later than September 30 of each year.	Program/project managers	Flight Operations Performance Measurements and Reporting
28	1.2.4.4	Program/project managers shall submit OMB Circular A-11, Exhibit 300, as appropriate, for aircraft and aircraft programs funded by their Directorate. These submissions shall be coordinated with the appropriate Mission Directorate, the Office of Infrastructure and Administration, and the Office of the Chief Financial Officer.	Program/project managers	Flight Operations Performance Measurements and Reporting
29	1.2.5.1a	The Center Chief of Flight Operations shall hold the following qualifications: a minimum of ten years of relevant aviation-related experience, supervisory or managerial experience in aircraft operations similar to the primary aircraft type operated at the Center, and a high level of	Center Chief of Flight Operations	IAOP Review

		familiarity with the organization's aircraft operations.		
30	1.2.5.1b	The Center Chief of Flight Operations shall hold the following qualifications: current or previously held qualifications as a NASA Pilot in Command, a military rating as an Aircraft Commander, or a Federal Aviation Administration Airline Transport Pilot certificate.	Center Chief of Flight Operations	IAOP Review
31	1.2.5.3a	The Center Chief of Flight Operations shall ensure the effective management of Flight Operations under that Center's cognizance, per NPD 7900.	Center Chief of Flight Operations	IAOP Review
32	1.2.5.3b	The Center Chief of Flight Operations shall authorize personnel to operate and maintain aircraft under NASA control.	Center Chief of Flight Operations	IAOP Review
33	1.2.5.3c	The Center Chief of Flight Operations shall determine the number of aircraft types in which an individual crewmember may maintain qualification at any given time and annually review that determination.	Center Chief of Flight Operations	IAOP Review
34	1.2.5.3d	The Center Chief of Flight Operations shall recommend assignment of the Center Aviation Safety Officer, with the concurrence of the Center Chief of Safety and Mission Assurance, to the Center Director for approval.	Center Chief of Flight Operations	IAOP Review

35	1.2.5.3e	The Center Chief of Flight Operations shall fly as a crewmember or observer on all assigned aircraft, where practicable and as necessary, to observe performance of assigned flightcrews.	Center Chief of Flight Operations	IAOP Review
36	1.2.6.1	The ASO shall manage the Center's aviation safety program as described in chapter 6 of this NPR.	Aviation Safety Officer	IAOP Review
37	1.2.6.2	The ASO shall be a civil servant assigned to the Flight Operations Department, serve as the Center's focal point for aviation safety, and act on behalf of the Center Director when discharging this responsibility.	Aviation Safety Officer	IAOP Review
38	1.2.7.1a	To qualify for assignment, the Chief Pilot shall hold and maintain qualification as a NASA PIC.	Chief Pilot	IAOP Review
39	1.2.7.1b	To qualify for assignment, the Chief Pilot shall have at least three years experience within the past six years as PIC of an aircraft similar in category and class to at least one of the aircraft used in the types of operations being conducted at the Center.	Chief Pilot	IAOP Review
40	1.2.7.1c	To qualify for assignment, the Chief Pilot shall demonstrate satisfactory supervisory and managerial capabilities.	Chief Pilot	IAOP Review
41	1.2.8.1a	To qualify for assignment, the Chief of Maintenance shall have had at least three years of experience within the past six years in aircraft maintenance in a	Chief of Maintenance	IAOP Review

		similar-size operation maintaining aircraft similar to those used by the Center, with management experience such as supervisor or lead in aircraft maintenance.		
42	1.2.8.1b	To qualify for assignment, the Chief of Maintenance shall have held an FAA Airframe and Power Plant Certification or have held an equivalent military designation, or demonstrate an equivalent level of qualifications and expertise.	Chief of Maintenance	IAOP Review
43	1.2.9.1a	To qualify for assignment, the Chief of Quality Assurance shall hold a current FAA Inspection Authorization Certificate or have held an equivalent military designation, or demonstrate an equivalent level of qualifications and expertise.	Chief of Quality Assurance	IAOP Review
44	1.2.9.1b	To qualify for assignment, the Chief of Quality Assurance shall maintain a level of inspection expertise and activity needed to meet FAA Inspection Authorization Certificate renewal requirements or the military equivalent.	Chief of Quality Assurance	IAOP Review
45	1.2.9.1c	To qualify for assignment, the Chief of Quality Assurance shall have had at least three years of maintenance experience, within the last six years, one year of which must have been as a maintenance inspector.	Chief of Quality Assurance	IAOP Review

46	1.2.9.1d	To qualify for assignment, the Chief of Quality Assurance shall have at least one year of experience in a supervisory capacity.	Chief of Quality Assurance	IAOP Review
47	1.4.1	When deviations from this NPR are necessary, Center Directors or Associate Administrators shall submit requests for waivers to the Assistant Administrator for the Office of Infrastructure and Administration via HQ AMD.	Center Directors or Associate Administrators	IAOP Review
48	1.4.1	Prior written approval from the Assistant Administrator for the Office of Infrastructure and Administration shall be obtained before implementing procedures that are less restrictive than those contained in this NPR.	Center Directors or Associate Administrators	IAOP Review
49	1.4.4	The waiver approval authority shall only approve waivers for a specific event, period, or duration and shall specify the boundaries of the requirement being waived.	Waiver Approval Authority	IAOP Review
50	1.4.5	The waiver approval authority shall notify all who have current waivers against this NPR when this NPR is updated and request verification of continued validity.	Waiver Approval Authority	IAOP Review
51	1.4.6	NASA officials who request waivers shall document the following in the request for waiver: a.) identification of the directive and specific requirement(s) for which the waiver is requested; b.) scope (e.g., site, facility, operation, or activity) and duration of the waiver request; c.) justification	NASA officials who request waivers	IAOP Review

for the waiver, including: (1) purpose/rationale for requesting the waiver; (2) whether application of the requirement in the particular circumstances would conflict with another requirement; (3) whether application of the requirement in the particular circumstances would not achieve, or is not necessary to achieve, the underlying purpose of the requirement; (4) any other pertinent data or information related to the waiver request (e.g., cost or schedule considerations); (5) identification and justification of the acceptance of any additional risk that will be incurred if the waiver is granted; (6) a description of any special circumstances that warrant granting the waiver, including whether: (a) application of the requirement in the particular circumstances would not be justified by any safety and health reason; (b) the waiver would result in a health and safety improvement that compensates for any detriment that would result from granting the waiver; or (c) there exists any other material circumstances that were not considered when the requirement was adopted, for which it is in the public interest to grant a waiver; (7) a description of any alternative or mitigating action that will be taken to ensure adequate safety and health and protection of the public, the workers, and the environment for the period the

		waiver will be effective.		
52	2.2.1	NASA aircraft shall be operated in an airworthy condition as certified by a formal NASA airworthiness review board, under the authority of a NASA Center Director, using a NASA Certificate of Airworthiness process.	Center Directors	IAOP Review
53	2.2.1	All NASA aircraft shall possess and maintain a NASA Certificate of Airworthiness (appendix E) approved by the Center Director.	Center Directors	IAOP Review
54	2.2.1	All aircraft used for MMA purposes shall possess a "Normal" or "Transport" category FAA Certificate of Airworthiness.	Center Directors	IAOP Review
55	2.2.1	When NASA aircraft are transferred between Centers, a new NASA Certificate of Airworthiness approved by the receiving Center Director shall be obtained.	Center Directors	IAOP Review
56	2.2.2	Airworthiness, flight safety, and mission readiness reviews, including configuration control, shall be conducted for all aircraft modifications, with the exception of those noted in 2.4.2.4 that are cleared through an airworthiness review process or configuration control process.	Center Directors	IAOP Review
57	2.2.3	Each Center shall clearly identify the appropriate airworthiness review process for experimental, research, and operational configurations and nonstandard ground or flight operations for all aircraft	Center Directors	IAOP Review

		operated by the Center.		
58	2.3.2	Center Directors shall establish airworthiness, flight safety, mission readiness, and configuration control review processes and procedures to identify any hazards, to manage the risks associated with flight programs, to ensure safe flight operations, to manage and thoroughly document aircraft configurations, and to ensure that flight objectives satisfy programmatic requirements.	Center Directors	IAOP Review
59	2.3.2	Center Directors shall ensure that these procedures are incorporated into the contracts of those who operate and maintain NASA aircraft.	Center Directors	IAOP Review
60	2.4.1	Center Directors shall establish procedures to ensure that airworthiness and safety reviews are conducted for flight operations or missions.	Center Directors	IAOP Review
61	2.4.1.1	Reviews shall ensure that hazards associated with aircraft experimental modifications, research, or unique internal or external payloads and nonstandard operations are identified and that risks are adequately managed to enhance the likelihood of mission and program success for all aircraft missions or operations and to minimize the risks to persons or property.	Center Directors	IAOP Review

62	2.4.1.2	Program managers shall review flight programs early in the development cycle to identify the need and schedule for additional safety-related resources, procedures, or reviews.	Program managers	IAOP Review
63	2.4.1.2	Managers shall ensure that aircraft modifications are accomplished with sufficient time for engineers and technicians to safely complete required tasks.	Program managers	IAOP Review
64	2.4.1.3	Center Directors shall establish configuration control procedures to ensure that the configuration of each NASA aircraft is fully documented and reviewed.	Center Directors	IAOP Review
65	2.4.1.3	A minimum equipment list shall be established for all non-test-related equipment for all aircraft operations.	Center Directors	IAOP Review
66	2.4.1.3	Test-related equipment will be handled through the flight test planning process. If test equipment remains on the aircraft for non-test-related missions, then such equipment shall be addressed in the aircraft MEL.	Center Directors	IAOP Review
67	2.5.1	Each Center Director shall ensure that the ARP is staffed with personnel possessing the appropriate scientific, engineering, operational, maintenance, and managerial expertise.	Center Directors	IAOP Review
68	2.5.1	At least one member of the ARP shall be a NASA pilot.	Center Directors	IAOP Review

69	2.5.1	The ASO shall be a member of the ARP.	Center Directors	IAOP Review
70	2.5.2	Any cockpit or cabin modifications that might interfere with aircrew egress shall be reviewed by a subpanel including aircrew and life support personnel.	Center Directors	IAOP Review
71	2.5.4	The ARP shall be continual throughout the course of a project.	Center Directors	IAOP Review
72	2.5.5	Each Center shall establish the content of the ARP based on the aircraft mission, complexity of the modifications, and the inherent hazards associated with the operation.	Center Directors	IAOP Review
73	2.5.5	Content for ARP approvals shall be documented in Center-level ARP procedures.	Center Directors	IAOP Review
74	2.5.5.2	The results of tests conducted to verify the engineering analysis also shall be considered.	Center Directors	IAOP Review
75	2.5.5.3	Actions to be taken in the event of in-flight malfunctions or emergency conditions associated with the aircraft modifications or nonstandard operations also shall be described.	Center Directors	IAOP Review
76	2.5.6	The final approval shall contain a description of the configuration of the aircraft, operating instructions and procedures, operating limitations and restrictions, and specific maneuvers or operations for which the aircraft is cleared.	Center Directors	IAOP Review

77	2.6.1	NASA aircraft shall be maintained in accordance with an established and documented maintenance program, using standards of quality in workmanship, materials, and support equipment that will ensure airworthiness of aircraft for safety of flight.	Center Directors	IAOP Review
78	2.6.1	Each Center shall develop written guidance for maintenance practices and procedures that include aircraft-specific (manufacturer, NASA, or DoD) maintenance practices.	Center Directors	IAOP Review
79	2.6.2	All NASA aircraft, specifically designated ground support equipment, and aircraft operated by NASA flight and ground crews shall be maintained under an approved airworthiness program.	Center Directors	IAOP Review
80	2.6.2	The program/process/ARP shall comply with applicable FAA-approved Original Equipment Manufacturer standards, DoD technical standards, or NASA standards in material quality and workmanship.	Center Directors	IAOP Review
81	2.6.2.1	NASA aircraft maintenance and quality assurance inspection programs shall address calendar, depot, periodic, phase, pre-flight, and post-flight inspections, and provisions for inspection and certification procedures of specific maintenance actions.	Center Directors	IAOP Review

82	2.6.2.2	NASA aircraft maintenance and quality assurance inspection programs shall address determination of the serviceability, authenticity, traceability, and airworthiness of parts, components, accessories, and assemblies by subjecting them to inspections, tests, or operational checks.	Center Directors	IAOP Review
83	2.6.2.3	NASA aircraft maintenance and quality assurance inspection programs shall address a configuration control process to ensure compliance with applicable airworthiness, service and safety bulletins, or other pertinent requirements, such as those from FAA, DoD, or OEMs. The process shall allow for documentation of alternate procedures or inspections if they are substituted.	Center Directors	IAOP Review
84	2.6.2.4	NASA aircraft maintenance and quality assurance inspection programs shall address a program for trend analysis and investigation of recurring discrepancies, high-failure-rate components, and high-usage materials.	Center Directors	IAOP Review
85	2.6.2.5	NASA aircraft maintenance and quality assurance inspection programs shall address documentation consisting of aircraft logs and records, accessory change records, weight and balance records, and aircraft property accountability records, as well as documentation required by NPR 4100, NASA Materials	Center Directors	IAOP Review

		Inventory Management Manual.		
86	2.6.3.1	A comprehensive aircraft maintenance quality assurance program shall be established at each NASA Center that is responsible for the maintenance of NASA aircraft.	Center Directors	IAOP Review
87	2.6.4.1	The Center Director shall ensure that quality assurance inspectors and maintenance personnel are trained, qualified, and assigned to implement a comprehensive maintenance and quality assurance program for Center Flight Operations.	Center Directors	IAOP Review
88	2.6.5.1	Center Flight Operations shall maintain continuous onsite oversight of vendors and facilities performing aircraft depot-level overhauls or major aircraft modifications to ensure quality of workmanship, maintenance of NASA standards, and schedule and cost control.	Center Chief of Flight Operations	IAOP Review
89	2.6.5.2	Individuals assigned onsite responsibilities shall have expertise and experience in aircraft airworthiness standards and requirements.	Center Chief of Flight Operations	IAOP Review
90	2.6.6.1	Each Center shall have a documented tool control program.	Center Directors	IAOP Review
91	2.6.6.2	Each Center shall have a documented FOD control program.	Center Directors	IAOP Review

92	3.1.1.1	Center Chiefs of Flight Operations shall establish procedures to ensure that all flights of NASA aircraft are properly approved and documented, allowing for all contingencies such as deployed aircraft and aircraft ferry approvals.	Center Chief of Flight Operations	IAOP Review
93	3.1.2.2	Emergency lifesaving, humanitarian operations, and Homeland Security missions, as pre-approved by the Center Director, may be carried out in any NASA aircraft he/she designates; the circumstances shall be documented and reported to the Assistant Administrator for the Office of Infrastructure and Administration.	Center Directors	IAOP Review
94	3.2.1	The PIC of a NASA aircraft shall be a designated NASA pilot.	Pilot in Command	IAOP Review
95	3.2.3	The PIC of a NASA aircraft shall ensure the crew is briefed on the mission plan, safety procedures, and emergency information, including emergency egress.	Pilot in Command	IAOP Review
96	3.2.4	Center Chiefs of Flight Operations shall have a process to train, designate, and document individuals authorized to pilot Functional Check Flight operations.	Center Chiefs of Flight Operations	IAOP Review
97	3.3	Records pertaining to NASA flight activities shall include, at a minimum, the following: a.) approval of mission; b.) name and duty status of all on board;	Center Chief of Flight Operations	IAOP Review

		c.) purpose of the flight; d.) routing or flight events and takeoff /landing times.		
98	3.4.1	NASA flightcrews shall be qualified in accordance with written standards set forth in Center-developed criteria.	Center Chief of Flight Operations	IAOP Review
99	3.4.1	Records of qualification and flight evaluation are required and shall be maintained in aircrew training records.	Center Chief of Flight Operations	IAOP Review
100	3.4.1	A review of pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met.	Center Chief of Flight Operations	IAOP Review
101	3.4.1	The Center Chief of Flight Operations shall designate the crewmembers for aircraft that are under the Center's purview.	Center Chief of Flight Operations	IAOP Review
102	3.4.3.1	Center Flight Operations shall impose sufficient proficiency requirements or flight time/sortie requirements on flightcrews to meet mission needs.	Center Chief of Flight Operations	IAOP Review
103	3.4.3.1	Center flightcrew currency shall, at a minimum, include the following: a.) annual night flying requirements; b.) landings in category (fixed-wing/rotorcraft); c.) six instrument approaches under actual or simulated conditions within six calendar months; d.) method to regain instrument or landing currency, once lapsed; e.) completing 100 hours of flight time per fiscal year, PICs must fly at least 50 of those hours as PIC. The hours shall be flown in any aircraft or flight	Center Chief of Flight Operations	IAOP Review

		simulator approved by the Center Chief of Flight Operations.		
104	3.4.3.2	Center directives shall establish separate aircrew qualification and currency requirements for unique aircraft (e.g., project, military, experimental) in which the aircrew cannot meet the above requirements.	Center Director	IAOP Review
105	3.4.4	Flight proficiency shall be evaluated at least once per year by a NASA or NASA-designated pilot who is an instructor or examiner pilot in the aircraft used for the evaluation.	Center Chief of Flight Operations	IAOP Review
106	3.4.5	Instrument flying proficiency shall be evaluated at least once per year using professional aeronautical standards such as FAA Instrument Practical Test Standards.	Center Chief of Flight Operations	IAOP Review
107	3.4.7	Written tests shall be administered and reviewed annually by a check pilot to ensure current pilot knowledge of air traffic control procedures, aircraft systems, normal and emergency operating procedures, Agency and local instructions, and other pertinent regulations and procedures.	Check Pilot	IAOP Review
108	3.4.8	Pilot annual flight evaluations shall be reviewed by the Center Chief of Flight Operations or designee.	Center Chief of Flight Operations or designee	IAOP Review

109	3.4.9	Each Center Chief of Flight Operations shall establish local instructions regarding training and currency requirements that must be met for a guest pilot/researcher.	Center Chief of Flight Operations or designee	IAOP Review
110	3.4.9	The Center shall establish policies for flying media representatives.	Center Directors	IAOP Review
111	3.4.10	Flight Engineers shall possess an FAA Flight Engineer Certificate appropriate for the aircraft category or equivalent military certification.	Center Chief of Flight Operations	IAOP Review
112	3.4.10	Centers shall develop alternate training programs to satisfy this requirement should the above personnel not be available.	Center Directors	IAOP Review
113	3.4.11	Qualified non-crewmembers shall be authorized by the Chief of Flight Operations to participate in flight operations to support mission requirements.	Chief of Flight Operations	IAOP Review
114	3.4.11	Qualified non-crewmembers shall be trained and will maintain qualification in accordance with local Center policies and procedures which shall, at a minimum, include cabin emergency and egress procedures.	Chief of Flight Operations	IAOP Review
115	3.6.1	Program managers shall conduct an MRR when multiple aircraft operations are to be conducted.	Program managers	IAOP Review
116	3.6.1	Prior to conducting an FRR/ORR, each individual aircraft involved in the flight or campaign shall have an approved Certificate of Airworthiness.	Center Directors	IAOP Review

117	3.6.2	The chairman of the Center Airworthiness Process Program or a representative shall attend all readiness reviews.	Chairman of the Center Airworthiness Process Program or a representative	IAOP Review
118	3.6.3	A supervisory Flight Operations pilot or other Flight Operations supervisory personnel shall chair and approve the FRR/ORR flight authorization.	A supervisory Flight Operations pilot or other Flight Opera-tions supervisory personne	IAOP Review
119	3.6.4	Prior to conducting an MRR, each aircraft involved in the flight or campaign shall have an approved FRR/ORR.	Center Directors	IAOP Review
120	3.6.4.1	The program/project management of the flight/campaign event shall assign an individual to chair and make the MRR evaluation and who has authorization to proceed with the flight program.	program/project manager	IAOP Review
121	3.6.4.1	The MRR shall consider the following: a.) flight experiment and science flight requirements; b.) organizational and functional chart; c.) payload status; d.) flight operations procedures; e.) aircraft separation/coordination; f.) communication plan; g.) inter-Center/interagency communication/coordination plan; h.) ground operations procedures dealing with hazardous systems; i.) schedule timeline; j.) roles and responsibilities; k.) science coordination requirements; l.) pre-accident and/or incident notification plan; m.) liability	Center Directors	IAOP Review

		coverage; n.) deployment; o.) logistics; p.) public affairs/outreach; q.) mission assurance.		
122	3.6.5	Centers, Component Facilities, and contractors that do not have an aircraft operations department and operate NASA aircraft/UASs shall coordinate with an alternate NASA Center aircraft operations department for FRR/ORR and MRR services and support.	Center Directors	IAOP Review
123	4.2.1	When operated as civil aircraft, maintenance and aircrew standards shall meet the requirements for retention of FAA airworthiness certification and operation.	Center Directors	IAOP Review
124	4.2.1	The Certificate of Airworthiness shall be displayed per FAR 91.203 (a) and (b).	Center Chief of Flight Operations	IAOP Review
125	4.2.1	Mission management flights shall be operated and maintained in accordance with FAR parts 21, 39, 43, 61, and 91 subparts A and B.	Center Chief of Flight Operations	IAOP Review
126	4.2.1	Centers shall develop policies/procedures to operate MMA in accordance with the procedures specified in OMB Circular A-126 and 41 C.F.R., chapter 101-36.4, as well as the provisions of this chapter.	Center Directors	IAOP Review
127	4.2.2	Mission management flights shall be conducted only in support of activities that constitute the discharge of NASA's official responsibilities and only when the aircraft is not otherwise scheduled for	Center Directors	IAOP Review

		"Mission Required" or "Required Use" flight operations.		
128	4.2.2	NASA employees shall not use mission management flights if commercial airlines, charter aircraft service, or ground transportation are reasonably available to meet the mission need, unless the flight is cost justified in accordance with OMB Circular A-126 and this chapter.	Center Directors	IAOP Review
129	4.2.3	Flights that require excessive deadheading or involve long, unproductive layovers shall be avoided, absent special emergency situations.	Center Directors	IAOP Review
130	4.2.3	Whenever practicable, inter-Center airlift requirements shall be combined.	Center Directors	IAOP Review
131	4.2.4	Travel authorized by another Federal agency or Congressional committee also shall be approved by an Official-in-Charge of a Headquarters Office or a NASA Center Director.	Center Directors	IAOP Review
132	4.2.4	The names of the passengers and purpose of travel for such passengers shall be documented in the mission management flight request form.	Center Chief of Flight Operations	IAOP Review
133	4.2.5	All passengers shall be manifested on NASA Form 1269, Flight Itinerary and Passenger Manifest.	Center Chief of Flight Operations	IAOP Review

134	4.2.5	Prior to departure of any mission management flight, the PIC shall certify the accuracy of the manifest and file a copy with a responsible ground agency such as a military, civil, or NASA operations office.	Pilot In Command	IAOP Review
135	4.2.6	NASA mission management flight operations shall be conducted under the cognizance of the Assistant Administrator for the Office of Infrastructure and Administration.	Assistant Administrator for the Office of Infrastructure and Administration	Flight Operations Performance Measurements and Reporting
136	4.2.7	The Assistant Administrator for the Office of Infrastructure and Administration shall designate NASA MMA.	Assistant Administrator for the Office of Infrastructure and Administration	Flight Operations Performance Measurements and Reporting
137	4.3.1	Required Use designation shall be controlled solely by the NASA Administrator and approved according to section 4.4.2 of this chapter.	NASA Administrator	IAOP Review
138	4.3.2	All passenger travel that can reasonably be performed using commercial airlines, charter aircraft service or ground transportation to meet the mission need may not be designated as Mission Required. Classification of a mission management (passenger or cargo) flight as Mission Required requires approval from the Assistant Administrator for the Office of Infrastructure and Administration before the flight and shall be coordinated with the HQ AMD.	Assistant Administrator for the Office of Infrastructure and Administration	IAOP Review

139	4.3.3	NASA employees shall not use mission management flights for Other Official Travel if commercial airline, charter aircraft service, or ground transportation is reasonably available, unless the flight is cost justified in accordance with OMB Circular A-126 and this chapter.	Center Directors	IAOP Review
140	4.3.5.1	When using "no commercial airline or aircraft service is reasonably available" to justify the use of mission management flights, actual airline schedule information shall be provided as part of, and attached to, the aircraft request.	Center Directors	IAOP Review
141	4.3.5	Other Official Travel that is not Required Use or Mission Required, as defined in 4.3.3 above, shall be authorized only when either: no commercial airline or aircraft (including charter) service is reasonably available (i.e., able to meet the traveler's departure or arrival requirements within a 24-hour period), unless extraordinary circumstances require a shorter period to effectively fulfill Agency requirements; or the actual cost of using a Government aircraft is not more than the cost of using commercial airline or aircraft (including charter service).	Center Directors	IAOP Review
142	4.3.5.2	The actual cost of using a Government aircraft is not more than the cost of using commercial airline or aircraft (including charter service). Such	Center Directors	IAOP Review

		cost justification shall be computed consistent with section 4.4.5.2 of this chapter.		
143	4.3.7	Use of PS or R&D aircraft for passenger transportation purposes, regardless of travel classification category, shall follow the same requirements as used for all other mission management flights, including compliance with 41 C.F.R. 101-37 and OMB Circular A-126, flight request and approval using NASA Form 1653, cost justification on NASA Form 1653 as required, and obtaining travel authorization approvals.	Center Directors	IAOP Review
144	4.3.7	When operated as civil aircraft, maintenance and aircrew standards shall meet those required for retention of FAA airworthiness certification and operation and shall be followed for any NASA mission management flight that carries passengers.	Center Directors	IAOP Review
145	4.3.7	The Certificate of Airworthiness shall be displayed per FAR 91.203 (a) and (b).	Center Directors	IAOP Review
146	4.3.7	Centers shall exercise caution to ensure that aircraft are returned to their FAA-certificated configuration after being modified for Program Support or Research purposes.	Center Directors	IAOP Review
147	4.3.8	Nonofficial travel on NASA mission management flights shall be authorized only when all the following conditions are met: a.) the aircraft is already	Center Directors	IAOP Review

		scheduled for use for an official purpose; b.) such nonofficial travel use does not require a larger aircraft than needed or alteration of flight itinerary for the official purpose; c.) nonofficial travel use results only in minor additional cost to the Government.		
148	4.3.8.1	All nonofficial travelers shall reimburse the U.S. Treasury in accordance with section 4.7.	Center Directors	IAOP Review
149	4.3.9	The Center Director shall certify, in writing, that nonofficial travel on a scheduled flight has met the above conditions.	Center Directors	IAOP Review
150	4.3.9	The Center shall retain this certification for a minimum of two years.	Center Directors	IAOP Review
151	4.4.1	All flights with passengers aboard NASA aircraft assigned to a Center shall be reviewed by the Center Chief Counsel for compliance with 41 C.F.R., part 101-37 and OMB Circular A 126, and approved in advance by the Center Director.	Center Directors	IAOP Review
152	4.4.1	In the case of aircraft assigned to HQ, those flights shall be reviewed by the General Counsel or Deputy General Counsel and approved in advance by the Assistant Administrator for the Office of Infrastructure and Administration.	Assistant Administrator for the Office of Infrastructure and Administration	IAOP Review
153	4.4.1	All flights classified as Other Official Travel that have Senior Federal Officials aboard shall be reviewed by the General Counsel or the Principal Deputy	Center Directors	IAOP Review

		General Counsel and approved in advance by the appropriate NASA HQ or Center approval authority.		
154	4.4.2	Mission management flights also shall be approved in advance, in writing, and generally on a trip-by-trip basis.	Center Directors	IAOP Review
155	4.4.2	The Administrator shall in each instance determine the appropriateness of Required Use flights following a finding of compliance with OMB Circular A-126 requirements by the General Counsel or Principal Deputy General Counsel (Administration and Management).	NASA Administrator	IAOP Review
156	4.4.2	While the Administrator may make a blanket determination that all use of NASA aircraft by certain employees, or travel in specified categories, qualifies as Required Use travel, such determinations shall likewise be in writing, be determined to be compliant with OMB Circular A-126 requirements by the General Counsel or Principal Deputy General Counsel (Administration and Management), and set forth the justification for that determination.	NASA Administrator	IAOP Review
157	4.4.2.1a	The Center Director must complete the following when a member of the flightcrew is also considered a passenger: The justification shall be annotated in the remarks section of NASA Form 1653.	Center Directors	IAOP Review

158	4.4.2.1b	The Center Director must complete the following when a member of the flightcrew is also considered a passenger: The flightcrew member shall have either a NASA travel authorization approved in accordance with NASA directives or a travel authorization approved by another Federal agency or Congressional committee.	Center Directors	IAOP Review
159	4.4.2.1c	The Center Director must complete the following when a member of the flightcrew is also considered a passenger: The flightcrew member shall be listed as a passenger on Form 1653.	Center Chief of Flight Operations	IAOP Review
160	4.4.2.1d	The Center Director must complete the following when a member of the flightcrew is also considered a passenger: If the flightcrew member is a Senior Federal Official, a family member of such Senior Federal Official, or a non-Federal traveler, the flight request shall be reviewed by the General Counsel or Principal Deputy General Counsel.	Center Directors	IAOP Review
161	4.4.3	Flights classified as Mission Required where NASA personnel are traveling to meet mission requirements also shall be reviewed by the General Counsel or Principal Deputy General Counsel (Administration and Management) and approved in advance by the Assistant Administrator for the Office of	Assistant Admin-istrator for the Office of Infrastructure and Administration	IAOP Review

		Infrastructure and Administration.		
162	4.4.3	The Assistant Administrator for the Office of Infrastructure and Administration shall ascertain prior to authorizing the flight that the purpose of the trip is for Mission Required travel as described in section 4.3.2.	Assistant Admin-istrator for the Office of Infrastructure and Administration	IAOP Review
163	4.4.3	Should special emergency situations preclude pre-flight review and approval, immediate action to review and approve the flight shall be taken as soon as practicable following the flight.	Center Directors	IAOP Review
164	4.4.3.1	General Counsel shall review the flight in advance if a Senior Federal Official, families of such Senior Federal Officials, or non-Federal travelers are passengers.	General Counsel	IAOP Review
165	4.4.3.1	Cost justification is not required. Authorization shall be coordinated with the HQ AMD.	Center Directors	IAOP Review
166	4.4.3.1	An MMA Flight Request (NASA Form 1653) is required, and the passenger manifest (NASA Form 1269) shall clearly distinguish aircrew from passengers.	Center Directors	IAOP Review
167	4.4.3.1	The remarks section of the NASA Form 1653 shall indicate what training and for whom the flight is being conducted.	Center Directors	IAOP Review
168	4.4.4	Travel by the following categories of people must be authorized in advance and in writing when traveling aboard mission management flights on Other Official Travel, and their status shall be annotated on the	Center Directors	IAOP Review

		flight request and manifest: a.) Senior Federal Officials; b.) members and families of such Senior Federal Officials; c.) non-Federal travelers.		
169	4.4.4.2a	Authorizations for Other Official Travel flights with Senior Federal Officials, families of such Senior Federal Officials, and non-Federal travelers aboard shall be reviewed in advance on a trip-by-trip basis by the Center Chief Counsel.	Center Directors	IAOP Review
170	4.4.4.2b	Authorizations for Other Official Travel flights with Senior Federal Officials, families of such Senior Federal Officials, and non-Federal travelers aboard shall be approved by the Center Director.	Center Directors	IAOP Review
171	4.4.4.2c	Authorizations for Other Official Travel flights with Senior Federal Officials, families of such Senior Federal Officials, and non-Federal travelers aboard shall be reviewed by the NASA General Counsel or Principal Deputy General Counsel (Administration and Management).	General Counsel	IAOP Review
172	4.4.4.3	At NASA HQ, all flights shall be reviewed by the General Counsel or Principal Deputy General Counsel (Administration and Management) and approved in advance by the Assistant Administrator for the Office of Infrastructure and Administration.	Assistant Admin-istrator for the Office of Infrastructure and Administration	IAOP Review

173	4.4.4.3	Other Official Travel flights on Center-assigned aircraft with no Senior Federal Officials aboard shall be reviewed by the Center Chief Counsel and approved by the Center Director without HQ review.	Center Directors	IAOP Review
174	4.4.5	When the mission management flight is for Other Official Travel, the approving official shall determine that one of the following criteria has been satisfied: a.) no commercial aircraft or airline service is reasonably available in accordance with paragraph 4.3.4.1; b.) the actual cost of mission management flights does not exceed the cost of using commercial airlines or aircraft (including charter service). For such "cost-justified flights," the cost of using commercial airline or aircraft services for justifying the use of Government aircraft shall: (1) be the current Government contract fare or price or the lowest fare or price known to be available for the trip(s) in question; (2) include any differences in the costs of any additional ground or air travel, per diem and miscellaneous travel (e.g., taxis, parking), and lost employee work time (computed at gross hourly costs to the Government, including benefits) between commercial air, charter air service, and Government aircraft. To capture the cost, including fringe benefits, of the employee's lost work time, a multiplier of 1.3285 must be	Center Directors	IAOP Review

		applied to the locality-adjusted hourly salaries of the individual travelers for the additional travel time. The hourly salaries of the travelers are determined by dividing the applicable current average annual salaries that are provided by the NASA Workforce Web site by 2,087. Selecting the "Average Salaries by Occupation and Center (table)" view will provide access to the necessary data to determine average salaries by occupation and grade for each Center. While Federal salary data can be found at many other locations, the NASA Workforce Web site is the official NASA source. Travel time is defined as the time required to travel from the office or home until arrival at the business location or hotel, whichever is earliest.		
175	4.5.1.1	The Assistant Administrator for the Office of Infrastructure and Administration shall approve policies and other matters involving NASA mission management flights (except those specifically outlined above) and ensure that the number of NASA-owned aircraft and their capacity to carry passengers and cargo does not exceed the level necessary to meet NASA's mission requirements.	Assistant Administrator for the Office of Infrastructure and Administration	IAOP Review
176	4.5.1.2	The Assistant Administrator for the Office of Infrastructure and Administration shall coordinate acquisition, assignment, or disposition of aircraft whose	Assistant Administrator for the Office of Infrastructure	IAOP Review

		primary purpose is the conduct of mission management flights with the appropriate Associate Administrators and Center Directors in accordance with OMB Circular A-76.	and Administration	
177	4.5.1.3	The Assistant Administrator for the Office of Infrastructure and Administration shall annually review mission management flight requirements, use, and associated costs, including variable cost rates for each aircraft used to conduct mission management flights.	Assistant Administrator for the Office of Infrastructure and Administration	IAOP Review
178	4.5.1.4	The Assistant Administrator for the Office of Infrastructure and Administration shall periodically review the need for all NASA aircraft whose primary purpose is mission management flight operations, and the cost effectiveness of NASA mission management flight operations in accordance with the requirements of OMB Circular A-76. Each such review of NASA-owned aircraft whose primary purpose is mission management flight operations shall be submitted to the General Services Administration when completed and to Office of Management and Budget with NASA's next budget submission.	(This is actually two requirements in one) Assistant Administrator for the Office of Infrastructure and Administration	IAOP Review
179	4.5.1.5	The Assistant Administrator for the Office of Infrastructure and Administration shall ensure that current (by fiscal year) variable cost rate for each aircraft utilized to conduct mission management flights is used by all NASA officials who operate and	Assistant Administrator for the Office of Infrastructure and Administration	IAOP Review

		account for NASA mission management flights to calculate the flight-by-flight cost justification required by OMB Circular A-126.		
180	4.5.2.1	Center Directors shall ensure that aircraft are used properly and that the functions, including contract functions, performed by their aircraft comply, at a minimum, with NASA, FAA, OMB, and other Federal requirements, policies, and procedures.	Center Directors	IAOP Review
181	4.5.2.2	Center Directors shall ensure compliance with 41 C.F.R., part 101-37 and OMB Circular A-126.	Center Directors	IAOP Review
182	4.5.2.3	Center Directors shall approve the use of their assigned aircraft to conduct mission management flights where passenger transport is not the primary mission.	Center Directors	IAOP Review
183	4.5.2.4	Center Directors shall designate aircrew to conduct mission management flights and ensuring continuing compliance with all governing regulations.	Center Directors	IAOP Review
184	4.5.2.5	Center Directors shall establish variable cost rates for aircraft under their control that are, or may be, used for passenger transportation. The rate will be developed using OMB Circular A-126, attachments A and B, incorporating the most recent 12 months of historical cost data available and shall be used to determine the cost justification for MMA flight requests. The rate shall be reported to the HQ	Center Directors (three requirements)	IAOP Review

		AMD not later than September 15 of each year and cannot be used until approved by that office.		
185	4.5.2.6	Center Directors shall annually review and document the Center's continuing need for aircraft whose primary purpose is the transport of passengers and the cost-effectiveness of such aircraft operations, as required by OMB Circular A-126 and reflected in the NASA Financial Management Requirements and guidance from the HQ AMD. Content of this review must include, in narrative format, a comparison of the past years' use with future requirements. Upon completion of the annual review, a copy shall be forwarded to the HQ AMD not later than October 31 of each year.	Center Directors	IAOP Review
186	4.5.2.6	When Government ownership of an aircraft is no longer justified, Center Directors shall identify such aircraft to the Assistant Administrator for Infrastructure and Administration for reassignment or disposal.	Assistant Administrator for the Office of Infrastructure and Administration	IAOP Review
187	4.5.2.7	Center Directors shall submit a monthly report of mission management flight data to the HQ AMD to arrive not later than the 20th of the next month.	Center Directors	IAOP Review
188	4.5.2.7	This mission management flight data submission must include all available mission management flight and request records for NASA aircraft under the control of the Center Director and must	Center Directors	IAOP Review

		reflect every flight flown by aircraft that has been, or may be, approved to transport passengers regardless of whether the passengers were aboard that flight. At a minimum, the following shall be provided: a.) NASA Form 1653, Mission Management Flight Request; b.) NASA Form 1269, Flight Itinerary and Manifest; c.) Cost Calculation Spreadsheet; d.) NASA Aircraft Management Information System (NAMIS) Form 1672, Aircraft Log.		
189	4.5.2.8	Certification documentation demonstrating compliance with paragraph 4.3.5 for any nonofficial travel use and documentation of the required reimbursement described in section 4.7 shall be included in the monthly mission management flight data submission. This responsibility may be delegated.	Center Directors	IAOP Review
190	4.5.4.2a	For subpanels, the IAOP chair will ensure the following: Subpanel members shall be Chiefs of Aircraft Operations and Chiefs of Aircraft Maintenance or their designees, as well as a representative from the HQ AMD who shall act as permanent executive secretary.	IAOP Chairman	IAOP Review
191	4.5.4.2b	For subpanels, the IAOP chair will ensure the following: Subpanels shall be convened at least annually in formal meetings; however, the subpanels shall act as standing committees subject to call by the chairperson to review urgent	IAOP Chairman	IAOP Review

		business. Informal meetings may be conducted by teleconference.		
192	4.5.4.2c	For subpanels, the IAOP chair will ensure the following: Subpanels, with IAOP chairperson concurrence, shall forward their recommendations through the HQ AMD to the Assistant Administrator for Infrastructure and Administration for final approval. Headquarters-approved recommendations shall be considered directive in nature and shall be reflected in NASA policy documents.	IAOP Chairman (three requirements)	IAOP Review
193	4.5.5.1	All crewmembers shall comply with the provisions set forth in this NPR and with FAA and OEM publications for their aircraft and other applicable directives, regulations, and instructions.	Center Directors	IAOP Review
194	4.5.6	A fully qualified pilot shall be designated as PIC and charged with the responsibility of conducting each NASA mission management flight.	Pilot in Command	IAOP Review
195	4.6.1.4	Records of all mission management flight operations shall be retained for at least two years and must include, at a minimum: a.) the tail number of the plane used; b.) the date(s) used; c.) the name(s) of the pilot(s) and flightcrew; d.) the purpose(s) of the flight; e.) the route(s) flown; f.) the names and status of all passengers on all legs of the mission.	Center Directors	IAOP Review

196	4.6.2	Center Directors shall ensure strict compliance with the following reporting requirements: a.) monthly submission of mission management flight data to the HQ AMD as required in paragraph 4.5.2.7; b.) annually reviewing and documenting the Center's continuing need for aircraft whose primary purpose is the transport of passengers and the cost-effectiveness of such aircraft operations, as required by OMB Circular A-126 and reflected in the NASA FMR and guidance from the HQ AMD. Content of this review shall include, in narrative format, a comparison of the past years' use with future requirements.	Center Directors	IAOP Review
197	4.6.2.2	Upon completion of the annual review, a copy shall be forwarded to the HQ AMD not later than October 31 of each year.	Center Directors	IAOP Review
198	4.6.2.3	Center Directors shall ensure the establishment of variable cost rates for each fiscal year for aircraft under their control that are, or may be, used for passenger transportation. This rate is to be used to determine cost justification for MMA flight requests and shall be reported to the HQ AMD not later than September 15 of each year.	Center Directors	IAOP Review

199	4.7.1	Reimbursement for nonofficial travel use shall be made in advance of the flight for travel on FAA aircraft, consistent with current FAA procedures.	Center Directors	IAOP Review
200	4.7.2	Reimbursement for nonofficial travel use of NASA-owned or -controlled aircraft shall be made in advance of the flight.	Center Directors	IAOP Review
201	4.7.3	Any flight involving nonofficial travelers shall require notification to the HQ AMD prior to the flight to ensure application of the Agency-wide procedures for reimbursement.	Center Directors	IAOP Review
202	4.8.2	R&D or PS aircraft used to conduct mission management flights shall meet the FAA certification standards required of mission management flights.	Center Directors	IAOP Review
203	4.8.3	Airworthiness of NASA mission management flights shall, at a minimum, meet the standards set forth in the Federal Aviation Regulations for similar business-type aircraft.	Center Directors	IAOP Review
204	4.8.3	Aircraft whose primary or secondary purpose is the transport of passengers shall be maintained as required for retention of FAA airworthiness certification.	Center Directors	IAOP Review
205	4.8.4	The cost of operation and the utilization of mission management flights shall be reported in accordance with Financial Management Manual 9353-6 (RCS-10-0000-00271) and OMB Circular A-126.	Center Directors	IAOP Review

206	4.9.1	NASA-owned and -controlled aircraft, including lease and charter, whose primary purpose is to meet mission requirements for research or program support, are public aircraft and are not authorized to carry passengers, even if the classification of the flight is Mission Required, without written approval from the Assistant Administrator for Infrastructure and Administration prior to such use. Approval shall be coordinated with the HQ AMD.	Center Directors	IAOP Review
207	4.9.1	The use of a NASA R&D or PS aircraft to provide passenger transportation shall be restricted to circumstances where such use does not conflict with program support or research functions.	Center Directors	IAOP Review
208	4.9.1.1	Centers shall document the justification for and approval of each flight used for mission management purposes and retain the documentation for two years.	Center Directors	IAOP Review
209	4.10.1	When deviations from this NPR are necessary, Center Directors shall submit requests for waivers to the Assistant Administrator for Infrastructure and Administration.	Center Directors	IAOP Review
210	4.10.1	Written approval shall be obtained before implementing procedures that are less restrictive than those contained in this NPR.	Center Directors	IAOP Review
211	4.11.2	A training file shall be maintained for each flightcrew member.	Center Chief of Flight Operations	IAOP Review

212	4.11.3	Pilots of MMA shall possess a current FAA First Class Medical Certificate.	Center Chief of Flight Operations	IAOP Review
213	4.11.3	Flight Maintenance Technicians shall possess a valid FAA Third Class Medical Certificate or NASA medical certificate issued within the past 12 months by a NASA-approved medical examiner.	Center Chief of Flight Operations	IAOP Review
214	4.11.4	PICs/SICs shall possess an FAA Airline Transport Pilot (ATP) Certificate with appropriate category, class, and type rating in the aircraft assigned.	Center Chief of Flight Operations	IAOP Review
215	4.11.4	To be designated an aircraft commander, the pilot shall meet the following minimum flight experience requirements: a.) 2,500 pilot hours (500 hours multiengine); b.) 100 pilot hours in type.	Center Directors	IAOP Review
216	4.11.5	Instructor pilots shall be selected by the Center Chief of Flight Operations from highly qualified PICs who have demonstrated the skill, maturity, and temperament to perform instructor duties.	Center Chief of Flight Operations	IAOP Review
217	4.11.7	Flight maintenance technicians shall possess an FAA A&P Certificate.	Center Chief of Flight Operations	IAOP Review
218	4.13.1	Each primary crewmember shall receive basic survival training on a one-time basis.	Center Chief of Flight Operations	IAOP Review
219	4.13.1	Additional survival training shall be required by appropriate Center management for those crewmembers engaged in frequent over-water or remote-area flights.	Center Chief of Flight Operations	IAOP Review

220	4.13.1	Newly assigned personnel with no previous survival training shall complete this requirement within 12 months of being assigned to flightcrew duties.	Center Chief of Flight Operations	IAOP Review
221	4.13.1	Pilots shall not be assigned as PIC until this requirement has been met.	Center Chief of Flight Operations	IAOP Review
222	4.13.2	Prior to initial designation, primary crewmembers shall receive instruction in the physiological aspects of high-altitude flight including altitude chamber indoctrination.	Center Chief of Flight Operations	IAOP Review
223	4.13.2	Refresher training academics shall be accomplished every five years.	Center Chief of Flight Operations	IAOP Review
224	4.13.3	Prior to initial designation and annually thereafter, each crewmember shall receive emergency egress training on each type of aircraft assigned.	Center Chief of Flight Operations	IAOP Review
225	4.13.3	Training shall include instruction on the location and operation of normal and emergency exits and cabin emergency equipment, such as fire extinguishers and life vests.	Center Chief of Flight Operations	IAOP Review
226	4.13.4	Each primary crewmember shall complete an approved formal course of instruction in the type aircraft to be flown, including a study of the systems and procedures applicable to the individual's crew position.	Center Chief of Flight Operations	IAOP Review
227	4.13.5	A formal systems training course is required every six months for pilots and every 18 months for flight maintenance technicians.	Center Chief of Flight Operations	IAOP Review

228	4.13.6	Maintenance Technicians shall attend refresher training that address changes to aircraft systems, test equipment, or critical troubleshooting and repair techniques every 24 months.	Center Chief of Flight Operations	IAOP Review
229	4.14.1	Flight training shall be conducted under the supervision of a NASA-designated flight instructor pilot or an FAA-certified flight instructor, either in an approved simulator or in an aircraft.	Center Chief of Flight Operations	IAOP Review
230	4.14.2	Prior to initial designation, each pilot shall receive a minimum of ten hours of flight training, eight hours of which may be conducted in a simulator.	Center Chief of Flight Operations	IAOP Review
231	4.14.3	In each six-month period, pilots shall receive a minimum of six hours of flight or simulator training.	Center Chief of Flight Operations	IAOP Review
232	4.14.4	Prior to initial designation, each maintenance technician shall receive training in such areas as traffic awareness and "see-and-avoid" techniques, aircraft servicing, weight and balance, and passenger care.	Center Chief of Flight Operations	IAOP Review
233	4.15	Only crewmembers who have completed their required training shall be used as required crewmembers on any passenger missions.	Center Chief of Flight Operations	IAOP Review
234	4.16.1	In the interest of flight safety and to ensure that all crewmembers have the opportunity to exercise their aeronautical skills and thereby	Center Chief of Flight Operations	IAOP Review

		maintain the proficiency level for which they have been trained, the minimum currency requirements set forth in table 4.2 shall be met.		
235	4.16.2	To maintain currency, flight maintenance technicians shall have flown at least three passenger missions each calendar quarter, or they must be accompanied by a current flight maintenance technician.	Center Chief of Flight Operations	IAOP Review
236	4.17.1	A pilot at the controls who does not meet the 90-day total hour requirements, but is otherwise current, shall increase all instrument approach minimums by 200 feet and 1/2-mile visibility (or the Runway Visual Range equivalent).	Center Chief of Flight Operations	IAOP Review
237	4.17.3	At the discretion of the Chief Pilot, pilots flying multiple types of aircraft who have met the "all types" requirements may satisfy the "in type" currency requirement by flying a training flight with a flight instructor. This training flight shall include a minimum of two instrument approaches, three takeoffs, and three landings.	Center Chief of Flight Operations	IAOP Review
238	4.17.5	Lapse in qualification greater than 90 days requires retraining of at least six hours dedicated flight or simulator training as determined by the Center Chief of Flight Operations and requires a formal flight evaluation by an instructor pilot.	Center Chief of Flight Operations	IAOP Review

239	4.18.1	The intent of the NASA flightcrew evaluation program is to objectively evaluate aircrew performance and, thereby, measure the effectiveness of the training program. Designated Instructor Pilots shall administer all flight checks.	Center Chief of Flight Operations	IAOP Review
240	4.18.1	An IP shall be designated for all flights in which instruction or evaluation is planned.	Center Chief of Flight Operations	IAOP Review
241	4.18.2	Prior to being designated in their crew position, and annually thereafter, pilots shall complete a proficiency evaluation flight conducted by a NASA-designated IP or an FAA-designated flight IP.	Center Chief of Flight Operations	IAOP Review
242	4.18.2	Pilots with overdue proficiency checks shall be scheduled only on training flights (i.e., non-passenger flights) with an instructor pilot.	Center Chief of Flight Operations	IAOP Review
243	4.18.3	Prior to being designated an aircraft commander and annually thereafter, pilots shall complete a line evaluation flight conducted by an IP.	Center Chief of Flight Operations	IAOP Review
244	4.18.3	Pilots with overdue line checks shall not be scheduled as a PIC until a check is completed.	Center Chief of Flight Operations	IAOP Review
245	4.18.4	Flight checks conducted by NASA IPs shall be recorded on NASA Form 1615 or Center equivalent, reviewed by the Center Chief of Flight Operations, and filed in the individual's training file.	Center Chief of Flight Operations	IAOP Review

246	4.19.1a	In addition to approving the use of MMA, the Assistant Administrator for the Office of Infrastructure and Administration and Center Directors shall ensure that the most cost-effective MMA is used to satisfy approved requirements. Exceptions to this usage shall be documented in writing.	Center Directors	IAOP Review
247	4.19.1b	In addition to approving the use of MMA, the Assistant Administrator for the Office of Infrastructure and Administration and Center Directors shall coordinate trip itineraries and requirements with other NASA activities that could benefit from the use of available seats on each trip.	Center Directors	IAOP Review
248	4.20.1	All personnel scheduled as primary flight crewmembers on NASA MMA passenger flights shall be trained and qualified in accordance with paragraphs 5.9 through 5.15 of this NPR.	Center Chief of Flight Operations	IAOP Review
249	4.20.1	Crew assignment, including identification of PIC, shall be designated in writing for each flight.	Center Chief of Flight Operations	IAOP Review
250	4.20.2	No aircraft carrying passengers shall be operated with less than the minimum basic crew specified below.	Center Chief of Flight Operations	IAOP Review
251	4.21.2	Basic crew duty time shall not be scheduled to exceed 14 consecutive hours except as set forth below.	Center Chief of Flight Operations	IAOP Review

252	4.21.2.2	Augmented crew duty time shall not be scheduled to exceed 18 consecutive hours.	Center Chief of Flight Operations	IAOP Review
253	4.21.2.2	Flights requiring augmentation shall be approved by the Center Chief of Flight Operations and documented and maintained on file for a period of 12 months.	Center Chief of Flight Operations	IAOP Review
254	4.21.2.3	Relief crews shall be pre-positioned if the mission schedule cannot be supported within the duty time limitations specified for a single or augmented crew.	Center Chief of Flight Operations	IAOP Review
255	4.22.2.1	Crew rest shall normally provide at least 10 consecutive hours free of all official duties.	Center Chief of Flight Operations	IAOP Review
256	4.22.2.2	At en route stops, crew rest shall not commence until one hour after termination of the mission in order to allow for necessary post-flight duties.	Center Chief of Flight Operations	IAOP Review
257	4.22.2.3	The crew rest period shall end one hour prior to the crew beginning official duties in preparation for departure, normally at least one hour prior to scheduled takeoff time.	Center Chief of Flight Operations	IAOP Review
258	4.22.2.4	Approvals for reduced crew rest shall be limited to one occurrence per crewmember during any seven-day period.	Center Chief of Flight Operations	IAOP Review
259	4.22.2.4	Such approvals shall be documented and maintained on file for a period of 12 months.	Center Chief of Flight Operations	IAOP Review

260	4.23.1	Flightcrew members shall not be scheduled, nor permitted, to function as members of MMA flightcrews, if their total professional flying time exceeds the flight hours shown in table 4-3.	Center Chief of Flight Operations	IAOP Review
261	4.24	Hazardous material as defined in 49 C.F.R. 171.8 shall not be transported aboard NASA MMA.	Center Directors	IAOP Review
262	4.24	Cargo to be shipped shall be routed through the Center's transportation office before acceptance or, if en route, cargo normally only shall be accepted from a certified shipper or freight forwarding agency.	Center Directors	IAOP Review
263	4.25	During all critical flight operations, cockpit activities and conversation shall be limited to those involved with the direct operation of the aircraft.	Pilot in Command	IAOP Review
264	4.26	Before departure, the PIC shall brief the crew on all essential information concerning the flight including weather, restrictions, and the duties and responsibilities of each flightcrew member.	Pilot in Command	IAOP Review
265	4.27.1	In those instances when, in the determination of the PIC, an extenuating circumstance requires loading or unloading passengers or cargo with an engine running, the following minimum precautions will be followed: a.) only the engine on the opposite side of the aircraft from the loading door shall be operating and shall be operated	Pilot in Command	IAOP Review

		at as low a power setting as practical; b.) a flightcrew member shall be positioned on the ground to ensure that passengers do not approach close to an operating engine or windmilling propeller.		
266	4.27.2	The PIC shall ensure that all passengers have been briefed on the Disclosure for Persons Flying Aboard Federal Government Aircraft (see appendix B-2).	Pilot in Command	IAOP Review
267	4.27.3	Thorough flight planning is essential to the safe and efficient conduct of MMA passenger flights. A flight plan shall be filed for each flight.	Pilot in Command	IAOP Review
268	4.27.3	Passenger flights shall be operated under instrument flight rules and, to the maximum extent possible, in controlled airspace; however, daylight flights of less than 100 nautical miles may be operated under visual flight rules if weather conditions permit.	Pilot in Command	IAOP Review
269	4.27.4	Considering weather forecasts and any known en route delays, the minimum amount of useable fuel required at takeoff shall be sufficient to do the following: a.) complete the flight to the destination airport; b.) fly from that airport to the alternate airport, if required; c.) fly after that for one additional hour using cruise fuel consumption at 10,000 feet mean sea level.	Pilot in Command	IAOP Review

270	4.27.5	Prior to takeoff, the PIC shall receive a thorough weather briefing concerning current weather and forecasts for the proposed route, destination, and alternate destination.	Pilot in Command	IAOP Review
271	4.27.5.1	Weather minimums for takeoff shall be not less than landing minimums unless a takeoff alternate is available.	Pilot in Command	IAOP Review
272	4.27.5.2	All flights shall be planned to circumnavigate areas of thunderstorm activity.	Pilot in Command	IAOP Review
273	4.27.5.3	Airport weather minimums shall meet or exceed the requirements of FAR part 91.	Pilot in Command	IAOP Review
274	4.27.5.4	When the pilot has less than 100 hours PIC experience in the type (make and model) aircraft being operated, the minimum descent altitude or the Decision Altitude and visibility landing minimums shall be increased by 200 feet and 1/2 mile (or the RVR equivalent) for all instrument approaches conducted by that pilot.	Pilot in Command	IAOP Review
275	4.27.5.4	In no case shall the landing minimums be less than a 400-foot ceiling and one-mile visibility.	Pilot in Command	IAOP Review
276	4.27.5.4	Takeoffs shall not be made if the airfield is below these adjusted landing minimums.	Pilot in Command	IAOP Review
277	4.27.6	Prior to activating any aircraft system, aircraft maintenance forms shall be reviewed and evaluated.	Pilot in Command	IAOP Review

278	4.27.6	Prior to flight, the PIC shall accept the aircraft by signing the form. DoD aircraft forms, Naval Aviation Logistics Command Management Information System (NALCOMIS), or equivalent forms may be used as a substitute for specific NASA forms.	Pilot in Command	IAOP Review
279	4.27.7	A copy of the current weight and balance data shall be carried aboard each MMA.	Pilot in Command	IAOP Review
280	4.28.1	On departure, navigational aids shall be set up to aid in a possible expedited emergency return, as well as to aid in establishing the initial en route course.	Pilot in Command	IAOP Review
281	4.28.2	If installed and operative, the CVR and FDR shall be turned on during the entire flight.	Pilot in Command	IAOP Review
282	4.28.2	Should an incident occur, the CVR and FDR power shall be removed and appropriate circuit breakers pulled following completion of the after-shutdown checklist.	Pilot in Command	IAOP Review
283	4.28.3	EGPWS/TAWS shall be used on all flights.	Pilot in Command	IAOP Review
284	4.28.3	Immediate and appropriate action shall be taken in response to all valid EGPWS/TAWS warning calls.	Pilot in Command	IAOP Review
285	4.28.4	Landing lights shall be used during all takeoffs and landings and when operating near airports or in high-density traffic areas.	Pilot in Command	IAOP Review

286	4.28.6	Flight Maintenance Technicians shall remain at their duty station throughout the climb and descent.	Pilot in Command	IAOP Review
287	4.28.7	TCAS/TCAD resolution advisories shall be followed.	Pilot in Command	IAOP Review
288	4.29.1	In-flight delays and readily discernible abnormal conditions shall be explained to the passengers.	Pilot in Command	IAOP Review
289	4.29.1.1	The PIC shall require that all passengers and crewmembers have safety belts securely fastened for taxiing, takeoffs, landings, and before entering an area of in-flight turbulence.	Pilot in Command	IAOP Review
290	4.29.1.2	Passengers shall not be admitted to the flight deck during "sterile cockpit" phases of flight.	Pilot in Command	IAOP Review
291	4.29.2	The PIC shall notify ATC of the aircraft "minimum fuel" status at any time the fuel supply has reached a quantity where, upon reaching destination, little or no delay can be accepted. In no case may this quantity be less than that specified in table 4-6.	Pilot in Command	IAOP Review
292	4.29.2	If fuel remaining indicates a need for traffic priority to ensure a safe landing, the PIC shall formally declare an emergency due to low fuel and shall report fuel remaining in minutes.	Pilot in Command	IAOP Review
293	4.29.3	When an emergency or in-flight difficulty arises, the crew shall complete the checklists and report the nature and extent of the difficulty, intentions, and assistance required to the controlling ground agency.	Pilot in Command	IAOP Review

294	4.29.3	In the event of an engine failure or shutdown, the aircraft shall land at the nearest suitable airport at which a safe landing can be made.	Pilot in Command	IAOP Review
295	4.30.1	During instrument arrivals, all available navigational aids shall be used. When available, precision approach guidance (Instrument Landing System or Precision Approach Radar) will be used for all night arrivals except for specific events during training flights.	Pilot in Command	IAOP Review
296	4.30.2	Pilots operating aircraft shall land the aircraft only when the flight visibility is equal to or greater than the visibility prescribed in the standard instrument approach procedure being used.	Pilot in Command	IAOP Review
297	4.30.4	The briefing will include a review of the procedure to be flown, including key altitudes and restrictions, as well as specific crew duties during the approach and landing.	Pilot in Command	IAOP Review
298	4.30.5a	During approach, the pilot flying the approach shall announce his/her progress and intentions periodically.	Pilot in Command	IAOP Review
299	4.30.5b	During approach, the pilot monitoring shall observe the approach and provide a continual cross-check of the navigational aids, instruments, air traffic control instructions, and approach procedures.	Pilot in Command	IAOP Review

300	4.30.5c	During approach, any deviations from the prescribed procedure shall immediately be brought to the attention of the pilot flying.	Pilot in Command	IAOP Review
301	4.30.5d	During approach, the pilot monitoring shall call out "1,000 feet above" and "100 feet above" all key altitudes, as well as "minimums" upon reaching the Missed Approach position.	Pilot in Command	IAOP Review
302	4.30.5e	During approach, when the runway is in sight, the pilot monitoring shall state, "runway in sight."	Pilot in Command	IAOP Review
303	4.30.5f	During approach, if the runway is not in sight when the aircraft reaches the Missed Approach point, the pilot monitoring shall state, "go around."	Pilot in Command	IAOP Review
304	4.30.6	To prevent excessive loss of altitude in the event of an autopilot failure, the pilot directing the aircraft shall maintain flight control contact throughout the final portion of an automatic coupler approach. Full manual control shall be assumed at or above published minimum altitude.	Pilot in Command	IAOP Review
305	4.31.1	On completion of the flight, the PIC shall ensure the flight plan is closed with the appropriate facility.	Pilot in Command	IAOP Review
306	4.31.2	The PIC shall take prudent measures to secure and protect the aircraft at en route stops.	Pilot in Command	IAOP Review

307	4.31.2	State Department Advisories and the DoD Foreign Clearance Guide shall be consulted for out-of-continental United States operations.	Pilot in Command	IAOP Review
308	4.31.3	All unusual events (e.g., overweight or hard landings, lightning or bird strike, static discharge, or flight through hail or severe turbulence) will be recorded in the aircraft log.	Pilot in Command	IAOP Review
309	4.32.1	Aircraft flight manual data shall be used to ensure adequate takeoff, climb, approach, and landing performance is available for the actual conditions encountered.	Pilot in Command	IAOP Review
310	4.32.2	Headquarters waiver is required for takeoffs from or landings on runways of lesser length runways.	Pilot in Command	IAOP Review
311	4.32.3	For normal operations, airfields shall be considered below minimums for takeoff and landing when winds, including gusts, are greater than those established in table 4.5.	Pilot in Command	IAOP Review
312	4.32.4	All flights shall be planned to have no less than the minimum fuel indicated in table 4.6 available at touchdown on the final landing.	Pilot in Command	IAOP Review
313	5.1.2	All UASs shall be operated to meet the requirements of this NPR.	Center Director	IAOP Review
314	5.1.3	Any UAS operated on behalf of NASA that operates within the National Airspace shall be piloted by an individual who is either a NASA pilot or holds an FAA Pilot's License.	Center Director	IAOP Review

315	5.1.4	Center Directors shall establish procedures to ensure that all UAS flights are properly approved and documented.	Center Director	IAOP Review
316	5.1.4	Center Directors also shall ensure that UAS flightcrews and operations receive direct oversight by the Center Flight Operations Office or through another Center with a Flight Operations Department.	Center Director	IAOP Review
317	5.2.1.3	A letter of agreement with local air facilities shall be completed to ensure that proper coordination of support requirements is understood and agreed to.	Center Director	IAOP Review
318	5.2.2	The UAS planner shall notify the U.S. Embassy or consulate in the HN of UAS operations within their represented country.	Center Director	IAOP Review
319	5.3.5	Flight planning for routes that afford little or no time to avert the response to an erroneous data entry that could lead to a significant mishap (Class C or higher) shall have independent review both before loading in the mission computer and after upload on the UAS is complete.	Center Director	IAOP Review
320	5.3.6.2	Upon notification of an in-flight emergency, emergency procedures shall be performed by the UAS pilot in accordance with the UAS operations manual.	Center Chief of Flight Operations	IAOP Review
321	5.4.1	A flight brief that includes the flightcrew, a program representative, and a maintenance representative shall be conducted prior to all flights.	Center Chief of Flight Operations	IAOP Review

		Briefs provide specific information in accordance with UAS SOPs. Briefs will include the following: a.) weather update; b.) program brief; c.) system update; d.) emergency divert airfields; e.) emergency procedures and terminology; f.) mission profile.		
322	5.4.2	Systems checks shall include an independent means to verify waypoints entered into a navigational system prior to takeoff.	Pilot in Command	IAOP Review
323	5.4.3	The UAS recovery checklist shall be adhered to in accordance with the operations manual.	Pilot in Command	IAOP Review
324	5.5.1	UAS flightcrew members shall become qualified in accordance with written standards set forth in Center-developed criteria.	Center Director	IAOP Review
325	5.5.1	Center Chiefs of Flight Operations, with the concurrence of the Center Director, shall designate a UAS pilot for a specific UAS aircraft type.	Center Director	IAOP Review
326	5.5.1	The Chief of Flight Operations shall ensure that each UAS flightcrew possesses an adequate level of training and experience to perform the duties of the designated positions.	Center Chief of Flight Operations	IAOP Review
327	5.5.2	UAS pilots shall receive qualification training under direction of a military, civilian, or NASA UAS instructor pilot.	Center Directors	IAOP Review

328	5.5.2.2	An initial UAS checkout training program shall be developed by each Center and documented in the UAS flightcrew flight record file with the approval of the Chief, Flight Operations Branch.	Center Chief of Flight Operations	IAOP Review
329	5.5.2.3	Existing UAS simulators and UAS aircraft of a similar nature will be used to train pilots prior to flying a UAS research vehicle.	Center Chief of Flight Operations	IAOP Review
330	5.5.2.4	Training for all members of the UAS flightcrew shall include crew resource management training.	Center Chief of Flight Operations	IAOP Review
331	5.5.3	A review of UAS pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met.	Center Chief of Flight Operations	IAOP Review
332	5.5.3	The Center Chief of Flight Operations shall designate the crewmembers for UASs that are under the Center's purview.	Center Director	IAOP Review
333	5.6.2	The Airworthiness and Flight Safety Review Board shall participate in or, at their option, conduct reviews to establish the airworthiness and evaluate the safety of flight operations.	Center Director	IAOP Review
334	5.6.2.1	The following topics shall be addressed by a NASA AFSRB to assess the risks associated with a UAS flight program: a.) general outline of major UASs; b.) communication links and frequency management plan; c.) flight control system and configuration control procedures; d.) backup systems	Center Directors	IAOP Review

		and procedures; e.) flight terminations systems including ground abort.		
335	5.6.3	The program/project manager shall limit the assessed collective risk associated with aerospace vehicle operation and ensure that the probability of doing harm to a member of the general public is not greater than the criteria established by NPR 8715.5, Range Safety Program.	Center Directors	IAOP Review
336	6.2.2	Center Directors shall ensure that the Center ASO is granted formal access to senior management when safety issues cannot be resolved at a lower level in the flight organization.	Center Directors	IAOP Review
337	6.2.5	The Headquarters Aviation Safety Manager within the Office of Safety and Mission Assurance shall be a qualified ASO.	Chief of Safety and Mission Assurance	
338	6.2.5	The ASM shall provide safety and mission assurance oversight for Agency aviation activities.	Chief of Safety and Mission Assurance	
339	6.2.5a	The ASM shall coordinate with AMD regarding OSMA requirements affecting aviation safety or reporting.	Chief of Safety and Mission Assurance	
340	6.2.5b	The ASM shall identify aviation safety issues through mishap investigation and analysis.	Chief of Safety and Mission Assurance	
341	6.2.5c	The ASM shall participate in the annual NASA ASO conference.	Chief of Safety and Mission Assurance	
342	6.2.5d	The ASM shall monitor the implementation of the Agency's Aviation Safety Program.	Chief of Safety and Mission Assurance	

343	6.2.5e	The ASM shall attend selected program flight readiness and safety reviews.	Chief of Safety and Mission Assurance	
344	6.2.5f	The ASM shall serve as an advisor to the IAOP and participate in IAOP activities, including meetings, reviews, and subpanel activities.	Chief of Safety and Mission Assurance	
345	6.2.5g	The ASM shall conduct aviation safety staff assistance visits and reviews.	Chief of Safety and Mission Assurance	
346	6.2.5h	The ASM shall coordinate recommendations from mishap investigations that require corrective action from sources or agencies outside of NASA.	Chief of Safety and Mission Assurance	
347	6.2.5i	The ASM shall participate in selected aircraft flight operations.	Chief of Safety and Mission Assurance	
348	6.2.7	The ASO subpanel chair is responsible for briefing safety issues and concerns of the Centers to the IAOP panel, and shall schedule and conduct subpanel meetings and teleconferences.	IAOP Aviation Safety Officer Subpanel Chairman	
349	6.2.8	The Center Chief of Flight Operations, with the concurrence of the Center Director, shall appoint an ASO.	Center Directors	IAOP Review
350	6.2.9.1	The ASO shall hold qualification as a NASA PIC in type.	Center Directors	IAOP Review
351	6.2.9.2	The ASO, within one year of appointment, shall complete a two-week course in aviation safety program management.	Center Directors	IAOP Review

352	6.2.9.2	Within two years of appointment, the ASO shall have graduated from a recognized Military Aviation/Flight Safety Officer Course or an Academic Aviation Safety Certificate Program (of at least six weeks' duration).	Center Directors	IAOP Review
353	6.2.10.1	Each Center shall establish a continuing education program to ensure that each ASO maintains adequate knowledge to discharge the duties of the office.	Center Directors	IAOP Review
354	6.2.10.1	To maintain familiarity with the latest aviation safety principles as a NASA ASO, the ASO shall be actively engaged in the Center's aviation operations program and complete 40 hours of continuing education in ASO course elements within 24 calendar months.	Center Directors	IAOP Review
355	6.3.1	The Center Aviation Safety Program shall be documented in a single comprehensive manual.	Center Directors	IAOP Review
356	6.3.1.1	The working group is chaired by the ASO, shall meet at least semiannually, and reports to the Chief of Flight Operations.	Center Directors	IAOP Review
357	6.3.1.2	Headquarters AMD, together with independent oversight from the Office of Safety and Mission Assurance, shall conduct an aviation safety review of each Center biennially utilizing the IAOP Review Program.	Aircraft Management Division	IAOP Review

358	6.3.1.2	Centers conducting flight operations shall perform an independent flight operations review during the alternate year when an IAOP review is not scheduled.	Center Directors	IAOP Review
359	6.3.1.3	The Center aviation safety program shall establish a procedure for collecting hazards/anomalies/Close Calls data from personnel.	Center Directors	IAOP Review
360	6.3.1.3	Centers shall follow the Close Call reporting requirements contained in NPR 8621.1.	Center Directors	IAOP Review
361	6.3.1.4	The Chief of Flight Operations with the assistance of the ASO shall conduct a Government/industry-recognized cultural survey, assessment, or workshop within aircraft operations every two years or within six months of hiring a new Chief of Aircraft Operations.	Chief of Flight Operations	IAOP Review
362	6.3.1.5	ASOs shall conduct safety training for operations and maintenance personnel.	Aviation Safety Officers	IAOP Review
363	6.3.1.5	The ASO shall establish a process to ensure that topics covered are disseminated to those who could not attend.	Aviation Safety Officers	IAOP Review
364	6.3.1.6	Centers shall establish an Aviation Safety Award program.	Center Directors	IAOP Review
365	6.3.1.7	The ASO shall ensure that risk assessment and hazard analysis procedures are established. These procedures must address risks, hazards, and mitigation methods associated with aircraft modifications and research flights in accordance with	Aviation Safety Officers	IAOP Review

		chapter 2 of NPR 8715.3, NASA General Safety Program Requirements.		
366	6.3.1.8	The ASO shall ensure that project and program safety plans are subject to a review process.	Aviation Safety Officers	IAOP Review
367	6.3.1.8	Once approved, the ASO shall ensure the plans are disseminated to all involved personnel.	Aviation Safety Officers	IAOP Review
368	6.3.1.9	The ASO shall ensure that aviation facilities are maintained and inspected in accordance with applicable OSHA and NASA safety standards.	Aviation Safety Officers	IAOP Review
369	6.3.1.10	The ASO shall provide safety oversight during the handling and stowage of cargo, including hazardous materials, aboard NASA aircraft.	Aviation Safety Officers	IAOP Review
370	6.3.1.11	ASOs shall ensure that aviation safety-related information is distributed throughout aircraft operations and maintenance.	Aviation Safety Officers	IAOP Review
371	6.3.1.11	Safety information that would be of interest Agency-wide shall be sent to the Office of Safety and Mission Assurance for distribution.	Aviation Safety Officers	IAOP Review
372	6.3.1.12	All NASA aircrew shall, at least once per calendar year, attend a crew resource management course of at least four hours in duration.	Center Chief of Flight Operations	IAOP Review
373	6.4.1	Each Center shall publish and maintain an Aircraft/Airfield Pre-Mishap Plan in accordance with the procedures established in NPR 8621.1.	Center Directors	IAOP Review

374	6.4.1	The plan shall be maintained for each NASA operational airfield, heliport, and aviation activity.	Center Directors	IAOP Review
375	6.4.1a	Each Center plan shall ensure local fire/crash-rescue personnel are briefed annually on rescue and emergency procedures peculiar to the aircraft regularly operated at that facility and prior to operation of newly acquired aircraft.	Center Directors	IAOP Review
376	6.4.1b	Each Center plan shall ensure that mock mishap drills are held and that the ASO evaluates the results to ensure optimal coordination with pre-mishap plans.	Center Directors	IAOP Review
377	6.4.1c	Each Center plan shall address procedures for aircraft mishaps away from home field.	Center Directors	IAOP Review
378	6.4.1d	Each Center plan shall establish procedures for notifying and working with the National Transportation Safety Board and the FAA for aircraft accidents reportable under Federal regulations.	Center Chief of Flight Operations	IAOP Review
379	7.2.1	Pilots shall hold an FAA First Class medical certificate, military pilot flight physical, or NASA flight medical certification renewed annually or more frequently if specified by the Center Director or a competent medical authority.	Center Chief of Flight Operations	IAOP Review
380	7.2.1.1	Flightcrew of high performance jet aircraft or ejection seat configured aircraft shall obtain a military pilot flight physical or NASA flight medical	Center Chief of Flight Operations	IAOP Review

		certification.		
381	7.2.1.2	Pilots 55 years of age and older shall be medically certified every six months.	Center Chief of Flight Operations	IAOP Review
382	7.2.2	Flight Engineers shall hold either an FAA Second Class medical certificate, military flight physical, or NASA flight medical certification, which must be renewed annually or earlier if specified by a competent medical authority.	Center Chief of Flight Operations	IAOP Review
383	7.2.3	Other primary aircrew shall hold either an FAA Third Class medical certificate, military flight physical, or NASA flight medical certification, which must be renewed annually or earlier if specified by a competent medical authority.	Center Chief of Flight Operations	IAOP Review
384	7.2.4	Qualified non-crewmembers shall obtain medical clearances as required by Center procedures. At a minimum, a medical screening must be conducted by a NASA physician as appropriate for the mission.	Center Chief of Flight Operations	IAOP Review
385	7.2.5	Center Directors shall establish procedures, in coordination with their personnel offices, to ensure that primary aircrews are assigned to duties not involving flying if they become medically disqualified.	Center Directors	IAOP Review
386	7.3.1	Copies of current medical certification shall be kept on file at the primary aircrew and qualified non-crewmembers' operating site.	Center Chief of Flight Operations	IAOP Review

387	7.5.1	Flightcrews shall report Special Issuances (FAA Waivers) and FAA Statements of Demonstrated Ability to the Chief of Flight Operations for review by a NASA Aeromedical Physician.	Center Chief of Flight Operations	IAOP Review
388	8.1	Center Aircraft Flight Operations organizations shall coordinate all aircraft acquisition and disposition actions with the cognizant Center Supply and Equipment Management Officer(s) in accordance with NPR 4200.1, NASA Equipment Management Procedural Requirements.	Center Directors	IAOP Review
389	8.2	Prior to acquiring aircraft for operational use, the Associate Administrator of the Mission Directorate or the Center Director shall submit an acquisition request to the HQ AMD per appendix G, along with a business case analysis in support of the aircraft acquisition.	Center Directors	IAOP Review
390	8.2.1.1	In completing appendix G, the program/project manager must coordinate with the Center Environmental Management Office to determine whether the proposed aircraft acquisition requires preparation of an environmental assessment.	Center Directors	IAOP Review
391	8.2.4	AMD shall enter all acquired aircraft into FAIRS.	Aircraft Management Division	IAOP Review

392	8.2.5	Centers shall record all acquired aircraft in the NASA Equipment Management System in accordance with NPR 4200.1, NASA Equipment Management Procedural Requirements.	Center Directors	IAOP Review
393	8.2.5	Centers shall register all aircraft, excluding parts and DoD-loaned aircraft, with the FAA.	Center Directors	IAOP Review
394	8.3.1	The program/project manager or Center Director shall notify the HQ AMD prior to acquisition of an aircraft whose intended use is solely for "parts aircraft."	Center Directors	IAOP Review
395	8.3.1.1	Centers shall remove the data plates from all aircraft acquired solely for parts purposes and forward the data plates to HQ AMD for disposition.	Center Directors	IAOP Review
396	8.3.1.2	Centers shall enter parts aircraft into each respective Center's property inventory records in accordance with NPR 4200.1, NASA Equipment Management Procedural Requirements.	Center Directors	IAOP Review
397	8.3.2	Aircraft materiel, such as spare parts, shall be acquired, managed, and controlled in compliance with NPR 4100.1, NASA Materials Inventory Management Manual.	Center Directors	IAOP Review
398	8.4.1.	Disposal of NASA owned aircraft shall be in accordance with Federal Property Management Regulations and the applicable portions of NPD 4300.1, NASA Personal Property Disposal Policy, and NPR 4300.1, NASA Personal Property Disposal Procedural	Center Directors	IAOP Review

		Requirements.		
399	8.4.1	Disposal of NASA aircraft identified as artifacts or heritage assets shall be in accordance with NPR 4310.1, Identification and Disposition of NASA Artifacts.	Center Directors	IAOP Review
400	8.4.1	Aircraft disposition shall be coordinated in advance with the HQ AMD and approved by the Assistant Administrator for Infrastructure and Administration.	Center Directors	IAOP Review
401	8.4.2	When an aircraft that has an FAA Certificate of Airworthiness is removed from the inventory, the Certificate shall be removed from the aircraft and forwarded to the HQ AMD for disposition unless the aircraft is transferred to another Government agency that intends to operate it or it is sold through GSA to a civil operator.	Center Directors	IAOP Review
402	8.4.3	When an aircraft is removed from the inventory that is not capable of obtaining an FAA Certificate of Airworthiness or is deemed by the Center Flight Operations Office to be unsafe for civil use, the manufacturer's data plate shall be removed and forwarded to the HQ AMD for disposition.	Center Directors	IAOP Review
403	8.5.1	Centers shall conduct annual physical inventories of Center-owned aircraft, including display aircraft, parts aircraft, and aircraft in flyable or non-flyable storage, to determine the accuracy of the records and the NEMS control system.	Center Directors	IAOP Review

404	9.1.1	Results of the reviews shall be used to update NASA-wide or local requirements in order to enhance standardization and improve productivity.	Center Directors	IAOP Review
405	9.2.1	The HQ AMD shall establish inter-Center review teams to review all aspects of Flight Operations at NASA Centers, including the implementation of Center procedures, either biennially or as determined by the HQ AMD.	AMD	IAOP Review
406	9.3.1.4	Local operations and maintenance documents will be made available to the team, and the team members will familiarize themselves with the documents before performing field work.	IAOP Review Team Leader	IAOP Review
407	9.3.2	Instructions for reviewers shall ensure compliance with established standards, including FAA, DoD, manufacturer, industry, and association standards.	IAOP Review Team Leader	IAOP Review
408	9.3.3	The team leader shall hold daily team progress meetings to discuss discrepancies and recommendations.	IAOP Review Team Leader	IAOP Review
409	9.3.4	The team leader's exit briefing shall be in sufficient detail to inform Center management of the status of local Flight Operations activities with particular emphasis on significant findings and recommendations requiring management attention.	IAOP Review Team Leader	IAOP Review

410	9.3.5	The review team shall document results in a brief report that focuses on significant findings and recommendations.	IAOP Review Team Leader	IAOP Review
411	9.3.5	The report shall be forwarded by the review team leader to the Assistant Administrator for Infrastructure and Administration with a copy to the Center Director.	IAOP Review Team Leader	IAOP Review
412	9.3.6	The Center Director shall respond to the Assistant Administrator for Infrastructure and Administration concerning corrective actions.	Center Directors	IAOP Review
413	10.3.4	The review teams shall, for Center review purposes, function independently of Center management.	IAOP Chairman	IAOP Review
414	11.3.1	Centers shall use the NASA Aircraft Cost and Performance worksheets in appendix F to report aircraft data to HQ AMD within 45 days after the end of each quarter.	Center Directors	IAOP Review
415	11.3.1.1	Centers shall use the Aviation Inventory Report worksheet in appendix F to report the number and type of aircraft operated.	Center Directors	IAOP Review
416	11.3.1.2	The Centers shall use the Aviation Performance Report worksheet in appendix F to report aircraft operational data, unless an Agency-wide aircraft operations data reporting system is utilized.	Center Directors	IAOP Review

417	11.3.1.3	The Centers shall use the Aviation Safety Report worksheet in appendix F to report aircraft operational safety metrics, unless an Agency-wide aviation safety reporting system is utilized.	Center Directors	IAOP Review
418	11.3.1.4	The Centers shall use the Aviation Financial Report worksheet in appendix F to report aircraft costs, including contracted CAS.	Center Directors	IAOP Review
419	11.3.1.4a	Center CFOs shall implement actions to correct any data errors uncovered in the Business Warehouse.	Center Chief Financial Officer	IAOP Review
420	12.2.2	Each Center Director and Chief of Flight Operations, in close coordination with the Center Human Resources Office, shall establish a process to designate pilots and aircrew.	Center Directors	IAOP Review
421	12.2.3	Each Center Chief of Flight Operations shall establish procedures for assignment of aircrew to flight status and document those procedures in the Center Aviation Operations Manual.	Center Chief of Flight Operations	IAOP Review
422	12.3.1	Each Center Chief of Flight Operations shall establish procedures for temporary removal of aircrew personnel from flight status for situations other than medical disqualification.	Center Chief of Flight Operations	IAOP Review

423	12.3.1	The Center Director, in accordance with Human Resources procedures, shall review and approve any non-medical-related proposal for removal from flight status in excess of 30 days.	Center Directors	IAOP Review
424	12.3.4	If the reason for removing the individual from flight status is an event that is properly classifiable as a Close Call pursuant to NPR 8621.1, the process for investigation described therein shall be followed.	Center Directors	IAOP Review
425	12.3.5.2	If a Flight Performance Board is convened, a flight status recommendation shall be delivered to the Center Director.	Center Chief of Flight Operations	IAOP Review
426	13.1.1	A Center shall not operate an airfield (or helicopter landing area) unless the Center adopts and complies with an Airfield Operations Manual in accordance with Section 13.2 of this NPR.	Center Directors	IAOP Review
427	13.1.2	Each Center operating an airfield shall ensure that the FAA Regional Airports Division Manager is provided a complete copy of the Center's most current Airfield Operations Manual.	Center Directors	IAOP Review
428	13.1.3	Centers providing access to their airfield to the general public for aircraft operations conducted under civil regulations shall identify all deviations and non-compliance from 14 C.F.R. 139 and provide this information to the Office of Infrastructure	Center Directors	IAOP Review

		and Administration for approval.		
429	13.1.4.1	Each Center shall develop and maintain an airfield emergency plan designed to minimize the possibility and extent of personal injury and property damage on the airfield in an emergency.	Center Directors	IAOP Review
430	13.1.4.2	Each Center shall coordinate the plan with law enforcement agencies, rescue and firefighting agencies, medical personnel and organizations, the principal tenants at the airfield, and all other persons who have responsibilities under the plan.	Center Directors	IAOP Review
431	13.1.4.3	At least once every 12 consecutive calendar months, review the plan with all the parties with whom the plan is coordinated, as specified in this NPR, to ensure that all parties know their responsibilities and to ensure that all information in the plan is current.	Center Directors	IAOP Review
432	13.1.4.4	Each Center shall hold a full-scale airfield emergency plan exercise at least once every 24 consecutive calendar months.	Center Directors	IAOP Review
433	13.1.5	Centers shall conduct training needed to meet the following requirements: a.) providing sufficient and qualified personnel to comply with the requirements of this NPR; b.) equipping personnel with sufficient resources to comply with the requirements of this NPR; c.) training all personnel who access movement areas and safety areas and perform duties	Center Directors	IAOP Review

		in compliance with the requirements of the Airfield Operations Manual and the requirements of this NPR.		
434	13.1.6	All NASA Centers operating airfields or aircraft ramp areas shall conduct a Pavement Condition Index survey at least once every five years.	Center Directors	IAOP Review
435	13.1.7	Airfield condition reporting shall be conducted in a manner authorized by the Center Director and meet the requirements in this NPR.	Center Directors	IAOP Review
436	13.2.1	Each Center shall maintain an Airfield Operations Manual that includes descriptions of operating procedures, facilities and equipment, responsibility assignments, and any other information needed by personnel concerned with operating the airfield.	Center Directors	IAOP Review
437	13.2.2	Each Center shall include in the Airfield Operations Manual the elements required by this NPR.	Center Directors	IAOP Review
438	13.3.1.1	Each Center shall provide on the airfield, during aircraft operations at the airfield, at least the rescue and firefighting capability specified for the level of operations.	Airfield Manager	IAOP Review
439	13.3.1.3	All rescue and firefighting personnel shall participate in at least one live-fire drill prior to initial performance of rescue and firefighting duties and every 12 consecutive calendar months thereafter.	Airfield Manager	IAOP Review

440	13.4.1	Each Center shall take immediate action to eliminate wildlife hazards whenever they are detected.	Airfield Manager	IAOP Review
441	13.4.2	Each Center shall ensure that a wildlife hazard assessment is conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airfields or an individual working under direct supervision of such an individual.	Airfield Manager	IAOP Review
442	13.4.3	Each Center shall conduct a training program by a qualified wildlife damage management biologist to provide airfield personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by this chapter.	Airfield Manager	IAOP Review
443	13.4.4	Each Center shall track and report all bird strikes and other wildlife strikes either in the Incident Reporting Information System or the NASA Aircraft Anomaly Reporting System in accordance with NPR 8621.1.	Airfield Manager	IAOP Review
444	13.4.5	Each Center shall conduct a periodic review of the bird hazard using a team similar to the U.S. Air Force Bird/Wildlife Aircraft Strike Hazard team.	Airfield Manager	IAOP Review
445	13.4.6	Each Center shall develop a wildlife hazard management plan using the wildlife hazard assessment as a basis.	Airfield Manager	IAOP Review

446	13.5.1	Unless otherwise authorized by the Center Director or the FAA (in the case of civil aircraft operations), whenever the requirements of this NPR cannot be met to the extent that uncorrected, unsafe conditions exist on the airfield, the Center shall limit aircraft operations to those portions of the airfield not rendered unsafe by those conditions.	Center Directors	IAOP Review
447	13.6.1	Each Center that deviates from a requirement under this section shall, within 14 days after the emergency, notify HQ AMD of the nature, extent, and duration of the deviation.	Center Directors	IAOP Review

Index